Food Manufacture

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Colour, Flavour, and Man.

THE RELATIONS that exist between the colour and flavour of a foodstuff and such physiological phenomena as appetite and digestion might well form a subject for scientific enquiry. It might be a profitable line of investigation to be taken up by a big manufacturing concern. Food colours are useful as well as ornamental; we prefer our food suitably coloured and we realise, in a general way, that the pleasing colour of a foodstuff transmitted through the eye to the brain, is further transmitted to the stomach, there stimulating the gastric juices and promoting appetite and digestion. Palatability is greatly influenced by appearance, and no doubt important psychological relations exist between colour and taste. In the same way, certain colours are associated mentally with certain flavours, and these associations are probably deeply rooted and have their origin in primitive nature. These generalisations are common knowledge, but it would be very useful to possess some precise data on a more elaborate scale.

Controversy.

In the present issue various authorities discuss some of the more important aspects of colours and flavours in relation to foodstuffs. Doubtless there are views expressed which will not find universal acceptance; that is inevitable. We should like to remind readers, however, that we hold no brief for any of the opinions expressed by contributors to this issue, or, for that matter, to any issue. We merely record what various substantial people in the industry have done and what they are thinking, and as we have not taken any part in these processes, we do not assume any responsibility. If a reader does not agree with a statement, then it is his duty to the common stock of knowledge to write the Editor and say so. This is how progress is made. Disagreement stimulates thought and enquiry.

Viewpoints.

Some advise confectioners and other users of colours for foodstuffs to mix their own colours in an attempt to match a desired shade. Others advise against this, which they hold is the particular province of the colour manufacturer, with his specialised experience and accurate appliances: they claim that he can perform mixing and colour-matching operations much more satisfactorily and efficiently than the majority of users are able to do.

Then, again, three or four years ago opinions were expressed in the scientific press that this country would do well to follow the example of the States and definitely specify a restricted list of a dozen or so permissible colours. In certain quarters it was held that the American schedule (which, by the way, now includes Brilliant Blue F.C.F.) is sufficient for the great bulk of the foodstuff industry, and that its adoption would facilitate the work of the consulting analyst, who is frequently called upon to identify the colouring matter used for a food. Personally, we always fight shy of restriction, and we are not altogether convinced that this policy of limitation of colours would be a good one for either the colour industry or the food industry. For one thing, it would limit the scope and hamper the creative powers of both. After all, there is a good deal of "art" in this business, and art does not thrive in fetters. The question is, Would this limitation benefit a few or would it benefit the majority?

To point to America is unconvincing. No doubt the American schedule (on paper) is a perfect model of excellence—but *is it?* We mean, is it all that it pretends to be? Is it wangle-proof? Is it anything better than old friend Prohibition? May it not be "absolute tripe"? Frankly, we do not know!

Babies like Beef.

According to the *Washington Star*, Dr. Clara Davis has been making experiments on baby feed-

ing. Babies were allowed to choose their own foods and eat as much as they liked. Thirteen babies have been under observation during the test. A tray is placed before each carrying a variety of foods, including beef, bone marrow, sweetbreads, liver, potatoes, carrots, turnip, cauliflower, cereals, sweet and sour milk and many fruits. An attendant nurse stands by and makes notes. Beef is their favourite food. All are thriving. But none of them will touch spinach.

Aluminium Cans.

The annual report of the Washington Laboratory gives some interesting particulars of experiments by E. F. Kohman on the use of aluminium for cans. Two years ago attempts were made to produce aluminium cans, but it was realised that the metal was not rigid enough for the bodies. In last year's report it was stated that fruits had been packed in cans with aluminium ends and that difficulty was experienced in getting these to hold in a seam because of the softness of the metal. In such cans, which were apparently unable to hold the vacuum, there was marked corrosion on the tinplate portion, but the aluminium ends showed no evidence of corrosion whatsoever, the enamelled coating being perfect throughout. In cans which still had a vacuum, there was no corrosion apparent either on the body or ends of the can.

It seems, says Dr. Kohman, that enamelled aluminium sheet is a suitable material as far as resistance to corrosion in canned fruit is concerned, but that it is too soft to hold a tight seam. Some alloys of aluminium are more rigid, but whether these will resist corrosion to the same extent must be left to actual test.

Aluminium Cans for Fish.

In an article appearing in a recent issue of *Norges Handels-og Sjofartstidende* (translated in *Modern Packaging*) it is stated that considerable work has been done towards the utilisation of aluminium in the packaging of foods.

The Norwegians have recognised the possibilities of aluminium and experiments have been in progress during the past ten years or so. Various products, especially sardines, have been packed in aluminium containers, and these have been opened and examined from time to time. It is stated that neither the metal nor the contents had suffered.

It would appear that the difficulties of obtaining an efficient seal, to which Kohman has drawn attention, have been either partly or wholly overcome. At a meeting of the Stavanger Canners' Association, Director Kloumann stated, in reply to Mr. Schouw, of the National Canners' Association, that experiments as to the resistance of blows, jars, etc., had been made, and that the question as to the most suitable alloy had been solved. Further packs of brisling and mossa were being put up to test the durability of the cans while in transit.

Mr. Schouw thought the aluminium cans attractive and advantageous, and he especially noted the lightness in weight. Kloumann stated that a container had been produced which, when opened, could be used as a cooking vessel. An interesting innovation was that of stamping the cans with advertising matter (illustrated on page 108) to replace the ordinary labels.

Medical Researches on Aluminium.

It will be recollected that the original investigations on the suitability of aluminium for food utensils were carried out as far back as 1893 by Plagge and Lebbin, at the instance of the Prussian War Ministry. A further research in considerable detail was carried out by *The Lancet*, and the results were recorded in 1913 and confirmed by further investigations in 1928. The general conclusion reached was stated as follows. "It would appear that aluminium vessels, if of suitable purity, are perfectly safe for cooking purposes, and even if small quantities are conveyed to the water or food, these are without influence on the health of the individual" (*The Lancet*, December 15, 1928).

This confirms the results of the elaborate investigation dealing with the action of foodstuffs on aluminium, which appeared in *The Lancet* (see pp. 5 to 17, January 4, 1913). The conclusion was then reached that any suspicion of aluminium communicating poisonous qualities to food in the process of cooking may safely be dismissed.

Metals in Food Colours.

The *Analyst* for February published the first report of the sub-committee formed to investigate, formulate, and recommend methods for the determination of arsenic, lead, copper, tin, zinc, and other metals in food-colouring materials. The terms of reference do not include consideration of the permissible quantities of such metallic impurities. This first report deals with the question of the determination of arsenic in synthetic dyestuffs. It was decided that destructive wet oxidation was the best method of bringing the colouring matter into a suitable condition in which arsenic could be satisfactorily determined. Nitric acid was selected as the most suitable oxidising agent. After oxidation, it is considered essential that a distillation process should follow so as to obtain a distillate containing all the arsenic and no disturbing impurities. For the actual determination of arsenic the sub-committee recommend the "Gutzeit" method (originally

due to Mayençon and Bergeret), or rather a modification of this method prescribed by the British Pharmacopœia, 1914.

Citral in Lemon Oil.

The Essential Oil Sub-Committee has found that the method official in the British Pharmacopœia, 1914, for the determination of citral in lemon oil is open to objection on account of the large variation in the results obtained. After numerous experiments the sub-committee adopted the method described in the report.

Sucrose in Condensed Milk.

In the first report of the Milk Products Sub-Committee, the opinion was recorded that the determination of total milk solids would be best attained by the subtraction of the sucrose present from the total solids (see the *Analyst*, 1927, p. 403)—*i.e.*, in absence of decomposition. The second report deals with the determination of sucrose in sweetened condensed milk, and it is recommended that the polarimeter method, with zinc acetate-potassium ferrocyanide clarification, be employed.

Ratfish-Liver Oil.

The liver oil of the ratfish (*Chimæra Collieri*) is a source of vitamin A. The oil is sold on the Pacific Coast of U.S.A. as a substitute for cod-liver oil, and it is stated that about 0·03 grm. of the oil is required daily to promote growth in rats.

Peppermint Cultivation.

There are several interesting articles on certain essential oils and citrus products in Bulletin No. 3 of the Imperial Institute, issued in October, 1929. The useful work that has been carried on for a number of years by the Imperial Institute in developing Empire resources is not as widely known in this country as it should be.

In an article entitled "New Crops for the Colonies: Peppermint, Geranium, and Lavender," it is pointed out that the question of growing crops subsidiary to the staple products of the country is receiving considerable attention at the present time in tropical colonies and dependencies. Of the different products that have been suggested, certain essential oils, such as peppermint, geranium, and lavender, are among the more promising, particularly for the higher regions of East Africa. Particulars are given in the article of the areas of production, market conditions, cultivation, harvesting, distillation, and yield for peppermint, geranium, and lavender. A bibliography is appended.

Citrus Products.

An article on citrus products in the same Bulletin is based on a memorandum recently supplied to the Empire Marketing Board by the Imperial Institute. The citrus products commercially important are: citrate of lime and citric acid, concentrated juice, raw juice, and essential oils. The principal source is the lemon; others are the lime and the orange. In the United States pine-apple juice and waste from the canning factories are now an important source of citrate and citric acid.

Citrate and Citric Acid.

In the preparation of citrate of lime, the hot juice, after preliminary treatment, is neutralised by whiting or ground chalk (or pure limestone) and the precipitated citrate is filtered off, washed, and dried. Full particulars of the process are given in the Bulletin.

As the bulk of the world's supply of citrate has been produced in Sicily, the Camera Agrumaria has been able to control the market and to fix the selling price. A recent development of the Italian industry is the formation of "Cifac," a syndicate of all the Italian citric acid manufacturers, in order to control the supply, distribution, and price of the Italian product. The "Cifac" will have first call on citrate made in Sicily. We depend almost entirely on imported supplies of citrate and citric acid, and with the limitation of exports from Italy, there is a good demand here for citrate. British manufacturers of citric acid have stated that they would welcome additional supplies from Empire sources and these, if of good quality, would meet with ready sales.

Citrus Juices.

The chief citrus fruits used in the preparation of concentrated juice are lemons (in Italy) and limes (in the West Indies). The raw juice, as expressed from the fruits, is usually concentrated by evaporation, either in open pans or preferably in steam-heated stills. In view of the established market in this country for concentrated lime juice, its production could be safely undertaken as an alterative to the preparation of citrate of lime. It is, however, important that the essential oil expressed with the juice should be recovered.

Raw citrus juice, prepared from limes, lemons, and oranges, is used for making beverages. The demand for raw lime juice is seasonal, and it is necessary for producers to keep in close touch with importers in this country. During the last three or four years, there has been a very large increase in the export of raw lemon juice from Italy, which is being increasingly used for beverages.

Citrus Oils.

The chief essential oils produced from citrus fruits are lemon oil, lime oil, orange oil, bergamot oil, and

mandarin oil. The oils are obtained from the peel by pressure (see FOOD MANUFACTURE, page 23) and in the case of limes and oranges also by distillation. Lemon oil, along with vanilla, are the most important flavouring agents used by food manufacturers. The world's consumption of lemon oil is about 1,000 tons a year. Sicily is the chief centre of production, and market prices are controlled at Messina. For an account of the various grades of oil reference may be made to a report of a lecture delivered to the National Bakery Students' Society by Drake-Law, and for the industry as carried on in Sicily in 1928 to a letter from Whymper, included in this report.

The Imperial Institute states that there is always a good demand for lemon oil, and during 1928 the price in London rose steadily from 8s. per lb. in January to 12s. 6d. in July and to 14s.-15s. at the end of the year. The rise in price is attributed to a reduction in the Italian production. However, in the March issue of FOOD MANUFACTURE it was pointed out that the price had dropped back to the neighbourhood of 7s., and the reasons for the collapse were discussed.

Clove Oil.

Information on this subject is contained in the Bulletin Economique Madagascar (1928, 25, 38), and the Bulletin of the Imperial Institute for 1928, p. 323 and 1929, p. 394. The chief centres of clove cultivation are the Island of Sainte Marie and the region of Soanierana. An opinion is expressed that if the world production does not exceed 12,000 tons the market will continue to be stable, but that fresh demands must be created to ensure good profits for the producer.

Chocolate Cake Colour.

Miss Emily Grewe read a paper on the effect of variation in ingredients on the colour of chocolate cake, at the annual meeting of the American Chemical Society. In no other baked product is there a greater variety of shades of colour than in chocolate cake. They range from greyish-yellow to rich mahogany, in accordance with a wide variation in preferences. The baker has to adjust the shade to that making greatest appeal to the majority of his customers and he must be able to produce this shade consistently. It was because of the effect of the ingredients of chocolate cake on its colour that Miss Grewe carried out baking tests and observed the changes in pH, colour, and flavour corresponding to variations in milk, soda, baking powder, salt, egg-yolk, and the kind and quantity of chocolate.

Acidity of milk is a very important factor in colour. Sweet milk produces a dark cake; strongly acid milk, a much lighter one. Change in pH, by the soda and milk factors, results in change of colour in terms of hue and brilliance. At pH 5·0 the colour of chocolate is yellow and at pH 7·5 it is red. Sodium bicarbonate may be used to produce a rich mahogany colour (pH 8·0) without detriment to flavour. Quantity and different brands of chocolate and cocoa produce cakes of different shades. Normal variations in quantity of salt and baking powder and in colour of egg-yolk are of minor importance.

Canned Chicken.

Poultry put up in cans and cartons has found sudden favour in the States. One method is to pack frozen fowls in cardboard cartons with transparent fronts, bearing the trade mark of the packer, the net weight of the contents, and the government inspection label. The fowls are ready for cooking after being thawed; the liver and gizzard are wrapped separately and are included in the package. Canned whole and half chickens have become very popular during the past year. Some firms are canning boned chicken; others cut up the chickens before canning.

Last month we made a brief note (see page 64) of the processing methods employed. These, of course, vary in details. Some packers are using rather elaborate mechanical equipment. In one case the birds are suspended by the feet from an overhead chain and killed by sticking with a knife. Two incisions are made—one through the mouth and the other below the eye. After bleeding for a few minutes, the tail feathers are plucked and the birds dipped for 30 or 40 seconds in water at 128° F. They are again hung for 5 or 10 minutes, and are then plucked, whilst suspended, removing the wing feathers first and afterwards starting at the head and working towards the tail. They are then hung, placed in a cooler, and packed, or instead of marketing direct they may be dressed and processed. For the latter purpose one may, however, start with frozen birds, in which case the first operation is thawing.

The subsequent steps involve singeing (mechanically), inspection, removal of head and feet, evisceration, and washing. They may then be either packed or canned. In the latter case, the chicken is placed in the can, jelly added if desired, the top soldered on, the can exhausted in steam for about 30 minutes and then cooked for 20 to 30 minutes in a steam pressure of 20 lbs. (about 260° F.), after which comes cooling (done with care), inspection, and labelling. Whilst cooling, the pressure within the cans and the retorts must not be allowed to differ materially.

Two illustrations of American factory operations are given on page 112.

Vanilla: Classification and Grading

By DR. H. DRAKE-LAW.

The first part of this article was published in FOOD MANUFACTURE *in October, 1929. That article discussed the cultivation, distribution, curing, and marketing of vanilla. Part III. will deal with the application and uses of vanilla pods.*

PART II.

Classification.

VANILLA BEANS are cultivated in a very small number of districts, and only five principal types are marketed. These are sold under marks originating in the country of exportation, and are graded in accordance with their flavouring value.

Mexicans come from Vera Cruz; Bourbons come from Madagascar, Reunion, Comoro, Seychelles, and Mauritius; Javas come from Java; Tahitis come from the Society Islands; and Guadeloupes or Vanillons come from South America.

The above order also represents the flavouring value, but variation within each group is considerable, and a simple grading such as the foregoing cannot be regarded as entirely reliable. There is, however, a notable similarity of aroma in the different qualities of beans within the one group. All Mexicans and Bourbons, for example, are softer and rounder in flavour than Tahitis or Guadeloupes, the latter being especially sharp and acrid to the palate.

The value and quality depend largely on the care taken during cultivation, but the curing also has a determining influence. The Mexican bean, for example, receives the greatest attention during the growing period. It is carefully disbudded and only the strongest fruit is allowed to mature. The individual beans of the restricted crop grow to great size and attain the finest aroma in the fully matured product. Guadeloupes, on the other hand, are taken from wild vines or from those little cultivated, and the bean is always misshapen in appearance and coarse in flavour.

There was formerly a great variation in the quality of the crops from the different islands of the Bourbon group, but this has now largely disappeared. The best products of Madagascar, Reunion, and Comoro now closely resemble each other in quality, and those of the Seychelles and Mauritius are scarcely inferior.

Grading.

Vanilla pods are graded in the same way as other market fruits. The product which has matured naturally on the vine represents the first quality, and the largest fruit has generally the highest market value. Immature and diseased beans, windfalls, and culls constitute the inferior types. Most cultivated beans are tied up in bundles of uniform length and quality to meet the requirements of the market. Guadeloupes and low grades are sold loose. The method of classification of the various types is represented below.

A Vanilla Plantation.

(By courtesy of Messrs. Cousinery, Marseilles.)

MEXICAN

Grade.	*Appearance.*	*Length.*	*Flavour.*
Prime, section 5	Dark brown to nearly black. Smooth, oily, and plump	6–9 inches	Finest quality
Good to prime, section 4*			
Section 4			
Good, section 3*	Dark brown and slightly hard	6–7 inches	Good quality
Section 3			
Fair, section 2	Reddish brown, and fairly hard and dry		Fair quality
Ordinary, section 1*	Light brown, hard and dry		
Section 1			
Prime cuts	Colour as prime. Some broken	Under 6 inches	Fine quality
Good cuts	Red and dry broken beans	Not bundled	
Ordinary cuts			
Inferior cuts	Early gathered and windfalls		

Bourbons.—Two extreme types appear on the markets and these may be described as soft and hard cured. The former is plump and oily in appearance, attractive to the eye and delicate in aroma. The latter is harder in constitution, drier and more shrivelled in appearance, and the aroma is more pungent but nevertheless pleasing. Intermediate grades are also marketed.

The soft cured bean seldom becomes heavily frosted with a vanillin efflorescence, and usually only a few heavy crystals appear at the ends of the bundles. The flavour is weakened due to the presence of excessive quantities of moisture. This quality does not keep well and the flavour deteriorates owing to mould formation. The fresh pod, however, has an exquisite aroma.

The hard cured bean soon becomes coated with a fine deposit of vanillin crystals. The flavour value is high, but the flavour itself is not as delicate as that of the softer cured bean. The keeping properties are excellent and mould formation is almost unknown.

The Bourbon bean appears on the market in almost countless grades, and a fine selection is the work of an expert. The rough classification is a natural one, and can easily be followed with a little experience. Fully matured fruit ranks as first quality. Over-ripe pods split during curing are classed as first splits. Less mature fruit, windfalls, and badly shaped pods fall into the lower grades.

Almost all Bourbon pods are made up into bundles of uniform length and quality. The best are chocolate-brown to black in colour, and are free from surface streaks or scabs. The first qualities vary in length from 6 to 8 inches. Inferior grades are frequently lighter in colour and shorter in length. They often show disease marks on the surface and have a shrivelled appearance without tendency to crystallise. The quality and strength of flavour are considerably lower than in prime beans.

The selection of vanilla pods is generally controlled by the aroma, but external appearance is also of importance in certain cases. Chocolate makers, for example, grind the whole fruit into the cacao mass along with the sugar ingredients. The appearance of the bean then becomes a determining factor, and shades which match the colour of the chocolate are preferred to the darker varieties. The following table shows the various grades of Bourbon beans.

BOURBON

Grade.	*Appearance.*	*Length.*	*Flavour.*
Firsts	Dark brown to black, plump and smooth	6–8 inches	Soft and natural
First Splits	Dark brown to black	5–8 inches	Good
Seconds	Harder and drier		
Seconds } Splits	Light brown and often scabby	5–7 inches	
Thirds } Splits			
Third Splits and ordinaries		4–6 inches	
Inferiors	Short and ill shaped		Weak
Vrac	No classification		

A large delivery usually contains all the above qualities, but in a small consignment some of the lower grades are omitted. A "round lot" is generally made up of 50 per cent. firsts and varying

The Vanilla Vine.

(By courtesy of Messrs. Cousinery, Marseilles.)

Bundling Vanilla Beans.

(By courtesy of Messrs. Cousinery, Marseilles.)

proportions of the lower grades. The following is an analysis of a typical small consignment.

	Length.	*Weight.*
Firsts	5 to 9 inches	255 lbs.
First splits	4 to 6 inches	25 lbs.
Seconds	4 to 8½ inches	113 lbs.
Second and first splits ..	—	—
Second splits	4½ to 8 inches	68 lbs.
Thirds	4 to 8½ inches	—
Thirds and second splits ..	—	—
Third splits	—	—
Ordinaries and third splits ..	—	—
Inferiors	3 to 6 inches	27 lbs.
Inferiors and ordinary splits ..	—	—
Vrac	—	—
	Total weight	488 lbs.

Any of the various qualities may be purchased separately and selected grades are also available. The value of selected firsts is about 30 per cent. more than that of round lots. Firsts of an average length of 6½ to 7 inches are worth 25 per cent. more than round lots, whilst first splits and seconds are valued at the same figure as round lots. The market value of all beans is subject to wide fluctuations and depends on the abundance of the crop. The season commences in the early part of the year, and market prices are generally lowest during this period. Serious buying begins in spring, and prices then advance or decline according to demand.

Java Beans are not much in demand on the British market and quotations are rarely requested. The following indicates the classification usually adopted and a short description is appended.

Java firsts: This is a black and pliable bean usually on the lean side. Java seconds: A hard bean, slightly brown in colour. Java thirds: Brown and hard. Java fourths: Very dry and light brown or yellow in colour. Splits are classified either as firsts, seconds, thirds, or fourths according to their characteristics.

Tahiti Beans.—This bean was formerly cheaper than the Bourbon type, and was then used in far greater quantities in this country. The price has advanced however during recent years, and the difference in values has now almost disappeared. The flavour is much coarser and more pungent than that of the Bourbon pod, and as a consequence the Tahiti bean has lost much of its popularity on the British market. The classification differs somewhat from those of the previous types, and the grades are indicated by differently coloured labels in the following order:

No. 1: Pink label. | No. 3: Yellow label.
No. 2: White label. | No. 4: Green label.

Guadeloupes.—These are the cheapest beans of all. They are always misshapen in appearance and coarse and pungent in aroma. The strength of flavour is high, and the bean is used chiefly for mixing with the finer grades for extract making. There is no classification of qualities, and the bean is always sold loose.

We are indebted to Messrs. Cousinery, of Marseilles, for information published in our first article, and for photographs printed in this issue. Many other friends have sent communications on the subject, and we desire to express our thanks to them also.

(To be continued.)

Packing Vanilla in Tin Cans.

(By courtesy of Messrs. Cousinery, Marseilles.)

Colouring and Flavouring of Boiled Sweets and Rock

By E. J. CLYNE,

Cooke's Mirror Mints, Ltd., Blaby, Leicester.

In the following article the reader will find a great deal of helpful, practical advice on the subject of colouring and flavouring boiled sweets and rock.

COLOUR AND flavour are used in the manufacture of boiled sweets and lettered rock as a direct appeal to the eye and palate of the consumer. It is essential, therefore, that the appeal so made should be immediate and lasting.

In the early days of sugar boiling there were but few varieties of sweets, and even they were practically the same article, with a variation in flavour. It was necessary, therefore, to add colour in order to afford a ready means of distinguishing the different lines and of capturing the interest of the consumer.

The same applies to-day, but now that there is such a wide range to choose from, it is necessary to study the consumer in every way.

The first thing to be considered, then, is the appearance, as this is the deciding factor with a potential customer in making a sale. If the article offered is not of an appetising appearance—if it is too highly coloured, or not sufficiently coloured, or if a combination of colours the tints of which do not harmonise—then the consumer has no inclination to taste, and no matter how finely flavoured the article may be, it is wasted.

With the rapid development that this class of product has made in the past few years the importance of the foregoing can be easily understood; and it is to the credit of manufacturers generally that it has been grasped. But appearance is not everything. The flavour must be in keeping with the appearance. Nothing is more disappointing than to purchase an appetising looking article and then to find the flavour is lacking in quality, or may be entirely different from the flavour indicated by its appearance. It is important, therefore, that the flavour should as far as possible have a relation to the colour. In many instances colours and flavours are a matter of habit, built up by long usage in the trade, such as "bull's eyes," flavoured with peppermint and coloured with black and white stripes. This old-fashioned sweet is a great favourite, and the colour suggests the flavour, but there is no reason for the colour apart from tradition.

In the case of the more advanced boilings, such as satin work and the soft centred products, these are generally the result of the initiative of the producer, and the shape, colour, and flavour should all harmonise.

It is a great mistake to use very bright and vivid colours in boiled sweets, for various reasons. The first and most important is that a vividly tinted sweet looks cheap and nasty; secondly, highly coloured sweets stain the tongue; and, thirdly, there is the question of cost.

It is a sound principle to use only the very best materials both in colours and flavours, even for cheap boilings, because they are generally much more highly concentrated, and only a little is needed to give the same result as large quantities of a cheaper quality. It will be found that in the end the "dearest is the cheapest and best."

The colours or dyes most generally used are coal tar products. In the Argentine, however, these are not allowed, and only vegetable dyes may be used. The latter are not so satisfactory, as they never give a bright finish. They are dull and lifeless, and have not the "sparkle" that can be obtained with the colours first mentioned.

It is important when using colours to make them quite "smooth," otherwise particles remain undissolved and will show up in the finished article, giving it an unwholesome appearance. These specks will spread after the goods have been kept a short time, particularly if they are exposed, and will quite ruin the appearance.

It is a good plan to mix the powdered colours into a paste or liquid of a uniform strength, and have them mixed for some time before they are required. This will give them time to mature, and no trouble will be caused with specking.

A point to be remembered when dealing with flavours is that many synthetic essences are much more volatile than others, and great care and discrimination should be exercised before deciding upon a synthetic essence as against an extract, although the former may be much cheaper. "Flying," or loss of flavour, can be prevented to a great extent by adding the essence to the batch when it is slightly cooled. It is a common experience to find the flavouring material being added to the batch immediately it has finished boiling, with a consequent loss of strength. Where practicable the boiling should be poured on to the slab, and the flavour "worked" in.

With all fruit flavours, acid is used to bring out the full effect. In the same way salt can be used to improve other flavourings such as butter, rum, etc., and if a small quantity of vanilla is used with certain floral flavours, it will give them body and fulness. But it must be used sparingly, or the original will be destroyed.

Like wine, boiled sweets are not at their best when first made. The flavour does not come out fully until they have matured for a few days. For this reason, it is advisable, when trying a new flavouring, to keep a sample of the product bottled for a week, when it should be tested again. The full

(*Continued on page 122.*)

The Use of Food Colours in Flour Confectionery

By EDMUND B. BENNION, M.Sc.Tech., A.I.C.
National Bakery School.

THE CRAFT of the confectioner, in whatever branch of the confectionery trade he is employed, is devoted to the production of articles of food which will not only please the palate and be readily digested, but which must possess an appeal to the eye. Confections which contain the very best of ingredients will find a very limited appeal unless their general appearance is such that it attracts the eye of the customer. On the other hand, it is not uncommon to find many foods containing inferior quality of ingredients and of less food value having an appeal and commanding big sales for the reason that their general appearance is so pleasing.

In order to produce commodities with this appeal it is very necessary to have some display of colour. This may be brought about by incorporating colours in icings and fondants or by the use of artificial decorations—a means not so desirable.

In the early days of flour confectionery—as well as sugar confectionery—the only available colours were the naturally occurring ones. With the advent of coal tar colours some of these have still held the field, partly because of their quality, partly due to prejudice.

With the growth of businesses and the development of the manufacture of many types of cakes from the manual scale to the factory scale, standardisation of the processes and products becomes essential. In this respect, in cake manufacture in particular, the colour of each particular kind of cake must always be the same, otherwise the public are not able to obtain a standard product from week to week.

With the development of decorated cakes of all kinds, but especially decorated birthday and Christmas cakes, gateaux and fancies, there has arisen a demand for a more extensive range of colours, which makes it possible to produce a wider range of decorated effects.

Natural Colours in Use.

One of the most popular colours, still extensively used, is carmine. This finds many applications because of its intensity of colour, and is largely used for incorporating with marzipan, since it retains its brilliant appearance in the presence of the oily almond products, especially when dry. It is also used for dusting fruits and flowers produced therefrom in order to impart a velvetlike finish of the correct hue.

Cochineal is widely used for all work in which various shades of pink are required, whilst carmine liquid has a very limited use in high-class work because of the many different shades that can be produced by the confectioner himself by treatment with acids and alkalis.

For icing sugars, fondants, and for tinting jellies, this form is very useful.

As far as yellow colours are concerned, saffron is the only one which survives, and this only in the West of England where saffron cake is made. Green colours are extensively employed, and spinach green (chlorophyll) is widely used, mostly as the paste. Its use continues because of the good colour obtained and also partly because of the prejudice against synthetic green colours, especially those produced many years ago which contained arsenic.

Caramel finds extensive use in the tinting of cakes, biscuits, puddings, icings, and similar products, and is often prepared by the confectioner himself from cane sugar.

Artificial Colours.

With the increased quality and the high degree of purity of these colours, their use has increased very considerably. The two important shades required in the baking of cakes are egg and chocolate colours. Many others are required for decorative work in icings, but in comparatively small quantities. The types of egg colours most generally used are mixtures of Tartrazine and Orange I., for the best quality; although cheaper ones contain Orange II.

These are all fast to baking; a most important point. Amaranth, which is a deep raspberry red shade, is used in the compounding of certain colours for use in jams, sausages, and cooked meats. It is also a constituent of chocolate colours, and is used with tartrazine to produce orange shades.

Erythrosine is used in the compounding of certain pink colours as it is absolutely fast to sulphur dioxide. It can be used in products when acids such as citric, acetic, or tartaric are not used, and so could be employed in colouring fondants but not in royal icing, since it is almost insoluble in acid solutions. Spots sometimes appear in icings when this colour is used by mistake due to the acid throwing the erythrosine out of solution, so producing the spots. Indigo carmine is the only blue colour permitted on the American schedule, and is mostly used for producing chocolate colour, greens, and violets, especially for icings.

Guinea green or apple green is a colour which has a limited application, since it is not very fast to light, sulphur dioxide, heat, and acids. Ultramarine, a mineral colour, is very largely used for blue shades, and is soluble in acids, so that it is easily incorporated in icings by grinding in a mortar with acetic acid prior to being used.

Use of Colours.

Colours which are to be used in foods which require baking must be of such a type that they can

stand up to the baking conditions—they must be able to stand high temperatures. This is especially important, because it is usually in the cheaper varieties of cakes that colouring matters must be employed for colouring purposes, as compared with "tinting" in better class goods. The most important factor in this class of goods also is the baking powder which is used in order to bring about aeration. For the baking powder, sodium bicarbonate is the alkali, and cream of tartar, tartaric acid, sodium ortho or pyrophosphates are the acid ingredients, and it is generally considered that the final product of reaction is alkaline. This, in conjunction with the temperature, has a destructive effect on colours—often changing the shade. This is especially the case with chocolate shades. This difficulty is further complicated by the fact that there is no single colour the exact shade of chocolate, and so the colours supplied to the confectioner are mixtures of various colours blended so as to produce a mixture which will stand up to baking conditions.

In practice it is quite common to use a chocolate colour and to supplement it with some caramel, or "Black Jack," as it is known in the trade. By standardising the quantity of each a standard colour is obtained.

With egg colours and pinks used largely in the production of special types of light, spongy cakes it is customary to use solutions, and for this purpose a 1 per cent. solution is prepared. The use of a definite number of drops of such a colour will produce the desired shade in the finished goods. If the dry powder were used it would be impossible to produce an even colour and streaks or spots would result. These sometimes do occur when the solution has not been correctly made.

Prepared Colours.

Many of the colours used in the confectionery trade are sold ready made up in solutions, the strength of which is unknown, and these are sold under names, such as egg yellow, raspberry red, which give an indication of their colour but not of their composition nor of the effect likely to be produced in the finished goods. These mixtures not only render uniformity of result impossible, but suggest a secrecy about colour blending entirely unnecessary.

Colours are sold either as powder, liquid, or compound. For the confectioner dry colours are the best proposition, provided a reliable brand is obtained. There are many powdered colours sold at comparatively low prices, but these are usually diluted with salt, sugar or dextrine. This practice is objectionable, and the reduced cost is in the long run a very expensive way of buying colours.

Liquid colours range in strength from 5 to 10 per cent. of true colour and from this their real value can be assessed, making due allowance for the water in which the colour is dissolved.

Compound colours are similar to liquids, but they contain in addition to the colour small quantities of thickening or flavouring agents. The true strength of such colours rarely exceeds 5 per cent., and no practical man need purchase colour in such an extravagant way, for liquid and compound colours are easily made up.

Tints not Colours.

In decorative work in confectionery the tendency to-day is to have tints instead of definite colour, and as a result most pleasing effects are obtained. The young men entering the confectionery trade now receive training in the correct use of colour, so that harmony of colours is an essential part of their training, and the practical application of this is reflected in the finer tints obtainable in the goods and the correct use of complementary colourings. In order to carry out satisfactory tinting of fondants the colour should not be too strong, so that it may be uniformly distributed through the fondant. Further, by means of a more dilute solution finer differences can be obtained. For this purpose 1 per cent. solutions are useful. It has been estimated that the expenditure of £1 sterling is equivalent to a turnover in fancies of from £500 to £1,000 worth of goods—a very small amount in view of its importance. Because of this, however, great care should be exercised in purchasing those colours which will give the brightest tints, which will be fast to light and bleaching agents, and also free from metallic impurities.

Aesthetic Appeal of Colours.

There is one colour which has always been a favourite, and that is pink. Many have been, and still are, the monstrosities perpetrated in an attempt to produce a bright-looking exterior to a cake. Fortunately the crude pinks are going and softer tints are taking their place. Of all colours used pink is the most popular, and it is extremely difficult to introduce new colours. To-day pale greens, with over-piping of ivy green, are gaining ground, whilst chocolate colours are popular, but colours such as blue and mauve have an extremely difficult time. One large concern have forged ahead with these colours by specialising in children's birthday cakes, and by applying suitable designs on a blue or mauve coloured ground have been highly successful. Perhaps children are less prejudiced in their tastes; or may it be that as yet their tastes have not been formed? It seems to those who try to introduce new tints and tones that there is a great amount of prejudice which adults possess where colours in food are concerned, and that has to be overcome before a wider range of colours can more generally be used.

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Colouring and Flavouring of Chocolate Centres

R. HAROLD MORGAN, B.Sc., A.I.C.

Manager Messrs. A. J. Caley and Sons, Ltd.

External appearance is the biggest factor in bringing about the first sale. Internal appearance and flavour are factors that bring about the necessary repeats which indicate the success and popularity of the goods. In the following article, the author discusses the practical points involved in the art of colouring and flavouring applied to chocolate centres.

COLOURING AND flavouring chocolate centres mainly differs from that of confectionery (*i.e.*, sweets) in two respects. Chocolate centres are covered by a highly coloured chocolate coating, and therefore it is usual to employ delicate shades of colour for the sake of contrast. Furthermore, the average chocolate centre is not a high-boiled product where temperature is liable to affect the flavour used; consequently a smaller proportion of essence is required, but it must be distinctive and natural in its effect on the palate.

Certain flavours and colours are always associated in the mind, the combinations being based on the appearance of the parent plant or fruit in its natural form. Pink suggests raspberry or strawberry; mauve, black currant; green, lime or sometimes peppermint; yellow, lemon; orange, orange, and so on. In such cases there is no difficulty in deciding upon the correct colour to use.

There are many other flavours in use for which no definite colour combination is expected. In such cases delicate colours (which are pleasing to the eye) are introduced by the manufacturer who realises the important psychological relationship existing between colour and taste. Palatability is much influenced by appearance, and the success of a flavour in a centre is enhanced when the centre is tinted in a manner that pleases the æsthetic sense of the consumer. In connection with the unconscious or subconscious mental grouping of flavours and colours it is extremely important not only to maintain the standard of flavour, but also the shade of colour. The public may not be sufficiently expert to distinguish minute differences in flavour, though that is questionable, but the regular consumer of confectionery, either as sweets or chocolate centres, quickly notices if the colour is altered, and thereby immediately becomes suspicious that some change has taken place in the composition of the sweetmeat—usually not for the better.

Foodstuff Colours.

The colouring matters employed in the foodstuff industry fall into two groups—viz., natural and coal tar or aniline. The former group comprises those colours which are obtained in a natural state or which can be extracted from Nature's products; while the latter group embraces a large range of colours derived from products obtained from the distillation of coal tar.

Natural Colours.

Cochineal is the alkaline extraction of the colouring matter contained in dried insects which attach themselves to certain plants, particularly of Mexican origin. To obtain consistent results it is advisable always to use solutions of the same strength, and to measure out carefully each time the quantity required to produce the desired carmine tint in a known weight of centre. This applies in the use of all colouring matters.

Hot water extraction of the dried stigmata of saffron gives a strong solution of the well-known colour, saffron yellow. As the solution weakens on keeping, it is inadvisable to prepare more than a week's supply at a time, particularly in summer.

A pale yellow tint can be produced by the use of annatto, which is a water, or more usually a dilute spirit extraction of the soft tissue of certain plants which grow in South America and the West Indies.

A natural colouring matter of universal occurrence is chlorophyll, the green pigment in plants. A word of warning might be inserted here to purchasers of natural colouring matters against the adulteration which is sometimes carried out by the admixture of fibre and parts of other plants which are dyed to the requisite shade with artificial dyes.

Coal Tar Colours.

The introduction of coal tar colours has revolutionised the question of colouring confectionery. Natural colouring matters have been practically superseded by those manufactured from the various products of coal tar distillation, as the latter are cheaper in price, of greater strength, and give more uniform results. A considerable prejudice has existed against the use of coal tar colours owing to cases of poisoning supposed to have been caused by the use of these substances. Possibly in the early days sufficient care was not exercised in purifying these products, but to-day manufacturers are able to guarantee the purity of their coal tar colours for use in foodstuffs, conforming with all the regulations and recommendations which have been issued on the matter. At least one firm in this country manufactures colours only for foodstuffs, and purchases should be made from a reliable firm of this nature. Space does not permit of an enumeration of the various chemicals used as foodstuff colours. The American Legislature has decreed that a certain

number of substances can be used as colours and it is advisable as far as possible to use the various specified members of this group, purchasing each in its pure powder state without adulterants such as salt and dextrin which make the price only fictitiously cheap.

Apart from the important question of purity, the chief property of foodstuff colours is that they should be fast, particularly to sulphur dioxide, which is present in sugar, glucose, gelatine, and other substances used in making chocolate centres. The necessity for maintaining uniformity of shade has already been emphasised. This can be ensured by making up solutions of the same strength each time and measuring out carefully the quantity required.

Flavours.

A well-finished chocolate covering and a carefully coloured centre go a long way to delight the æsthetic sense, but full satisfaction is only realised by the incorporation of a distinct flavour which blends with the whole. The selection of flavours is truly an art! The cost factor is important, but is not such an enormous obstacle when one considers the weight of a batch of cream which can be flavoured by a small quantity of essence. In any case flavour is so important that it is essential to use the best possible that can be obtained.

The term "flavour" covers a wide range of substances which, however, can be roughly classified into natural and artificial groups. The natural group may be subdivided, and one section includes miscellaneous flavours as spices, animal and vegetable bodies, balsams, herbal liqueurs, fixed oils, fats, waxes, etc. Butter can be cited as an example of this section. Its incorporation in butter-scotch, nougatine, and caramel helps to give the flavour so distinctive of these high-boiled centres.

Another section includes the essential oils, the most popular of which are lemon, peppermint, orange, and lime. These appear on the market as "straight" oils, or in more concentrated forms as terpeneless and sesquiterpeneless oils. The latter are expensive, but it must be remembered that they are free from the terpenes which do not add to their flavouring qualities. The terpeneless oils may be regarded as the very "essence" of the flavour, and in the case of lemon oil, for example, are twenty-five times as strong as the parent straight oil from which they are distilled, although the flavour is inferior in quality.

When using essential oils it is of vital importance to buy a really genuine article. This point needs emphasis as there is so much adulteration carried on in this class of flavours. An adulterated oil, however good and cheap it may appear to be, never gives satisfaction, for in the course of time the flavour evaporates and the chocolate centre becomes tasteless, or, worse still, it may develop an obnoxious taste. Adulteration to-day is really a specialised art, and in certain cases even a well-trained chemist finds detection difficult. A good "nose" is a valuable asset, and purchases from a reliable source only should be made.

Fruits form another section of natural flavours, both in their natural state and derivatives. A very pleasing centre is a fruit itself such as cherry or strawberry in a fondant cream. The juices of fruits, both natural and concentrated under a vacuum to preserve the flavour, give excellent results with cream and other centres. Syrup extracts, which can also be obtained as solid extracts, are forms of fruit juices preserved in sugar. Fruit aromas are the result of special alcohol and ether extractions of the fruit and are employed to "tone up" the flavour used.

These flavours are ruined by exposure to high temperatures. They are excellent for use in creams, fondants, jellies, and marshmallows, to which they can be added during the remelt before depositing. The presence of a little acid, such as citric or tartaric, helps to bring out their natural characteristic flavours.

The artificial group comprises those essences which are wholly synthetic, and while they may be necessary for high-boiled goods, do not give good results in chocolate centres—alone at any rate. It is difficult in the case of a cream, for instance, absolutely to disguise the taste of a synthetic essence, however cleverly the chemicals may be blended together. For cheaper centres compound essences—*i.e.*, essences consisting of a base of natural flavour fortified with added chemicals—are often used. These vary considerably, depending entirely on the skill of the essence blender.

The art of flavouring is to give to the consumer a palatable confection of a distinct and recognisable flavour.

Enquiries

98. We want a reliable thermometer graded up to 230° F. for circular steam-jacketed pans with hinged lids, and shall be glad if you will give us the names of two manufacturers who specialise in this style of thermometer.

99. Wanted, the names of firms making colour Pea Green No. 51050.

Aluminium Cans showing Stamped Labels. **(See page 98.)**

Meat Preparations and Flavourings

By A. SAMSON, A.R.C.S., A.I.C.,
Chief Bacteriologist, Poulton and Noel, Ltd.

The following article sets out in plain, non-technical language the progress made in the science and practice of flavouring various kinds of meat preparations, such as sausages, pies, brawns, and puddings.

FLAVOURING SUBSTANCES have been used with meat, to produce more appealing and more palatable dishes, ever since the time when meats were mixed with other foodstuffs.

For the purpose of this article, the flavouring substances generally used with meat preparations may be considered to be the herbs and spices, these terms being used in their widest sense, and include, for example, sage, thyme, coriander, pepper, mace, nutmeg, ginger, and many others. They are generally referred to in the trade as "seasonings," and are invariably used in the powder form—that is, the pepper or coriander or sage are all ground to a powder, in some cases fine, in others coarse. It will therefore readily be appreciated that in those factories which use a large amount of seasoning, big stocks of mixed and unmixed materials must be held in readiness, owing to the appreciable quantity of each seasoning that has to be used to produce a flavour.

Perhaps it is not generally realised that the bulk of any seasoning used in powder form is valueless from the flavour point of view. Most of the seasonings consist largely of starch. The actual flavour of these various materials is dependent on the essential oils and resins which they contain. The content of oil varies within wide margins, being as low as 1 per cent. in the case of coriander, and as high as 15 to 20 per cent. in the case of mace. One can, therefore, understand how it is that the bulk of the original ground seasoning is valueless for flavouring purposes. In the case of coriander, for example, since it contains only 1 per cent. essential oil, 99 per cent. of the ground material is useless in imparting flavour. In the case of mace, approximately 80 per cent. is useless, and so on.

These introductory remarks raise the question as to whether it is possible to use the concentrated flavours or essential oils for the flavouring of meat preparations in place of the old, ground seasoning. The following remarks will show why these oils should be used, and how they can be used under commercial conditions.

Very often in the preparation of sausages and similar products, herbs such as sage are used, and these being coarsely ground and dark in colour have an undesirable tendency to show up as specks or "bits of dirt." In the preparation of brawns, owing to the large amount of jelly present, particles in suspension have a tendency to settle out while the liquid jelly is cooling; hence the addition of a powdered seasoning, such as pepper, ginger, or coriander, aggravates the condition. On turning out the cold, set brawn from its mould, the appearance of the top is marred by the sediment of spices and dirt collected in the jelly. Another disadvantage is storage space. Furthermore, it will be found that oils are cheaper for flavouring.

As to the oils themselves, these must be treated with respect, owing to their strength and pungency. A description of some of the more common concentrates will not be out of place.

Pepper.—This is sold either as an Oil of Pepper, almost white in colour, or Oleo Resin Pepper, which is dark green. The latter is extremely powerful for flavouring and is preferable.

Ginger.—Either as Oil of Ginger, or better still, Oleo Resin Ginger, which is more powerful.

Coriander.—Oil of Coriander, almost water white in colour.

Mace.—A brown, buttery oil, consisting of a mixture of hard and soft material.

Sage.—Essence of Sage, an alcoholic solution obtained by treating the crushed leaves with alcohol.

Thyme.—Essence of Thyme, an alcoholic solution.

Parsley.—Essence of Parsley, an alcoholic solution.

Nutmeg.—Oil of Nutmeg, a pale yellow oil. This is sometimes sold as Oil of Mace, but should not be accepted as such. True Oil of Mace is the brown, buttery oil.

Cinnamon.—Oil of Cinnamon.

Mustard.—Oil of Mustard.

Owing to the great strength of these concentrates, only minute quantities are incorporated in the batches, and it is essential to mix these oils with some diluent in order to ensure accuracy of measurement. In the writer's opinion the following method is the best for works' practice. This method takes advantage of the fact that these oils, essences, and resins are soluble in oil. The best oil, so far found, is Ground Nut Oil. This must be a refined, odourless quality, and in purchasing, it is necessary to specify exactly one's requirements. Odourless Soya Bean Oil has also been tried, but it is not quite as good as the Nut Oil.

First of all, it is necessary to procure the formula of the dry seasonings used and the relative proportions. Then, in order to obtain the proportional quantities of oils to be used, one multiplies each quantity of dry seasoning used by the percentage of oil that seasoning contains. Of course, these figures will be only approximate, but they will be near enough to give an indication of the proportions, and

perhaps one or two tests will give the figures more correctly. For example, suppose a seasoning mixture consisted of 10 lbs. mace, 40 lbs. pepper, and 50 lbs. coriander. We may assume the approximate oil contents of these to be: mace 20 per cent., pepper 5 per cent., and coriander 1 per cent.

Hence the quantities of oil used would be:

$$\text{Mace } \frac{20}{100} \times 10 = 2 \text{ lbs.}$$

$$\text{Pepper } \frac{5}{100} \times 40 = 2 \text{ lbs.}$$

$$\text{Coriander } \frac{1}{100} \times 50 = \tfrac{1}{2} \text{ lb.}$$

This mixture would produce a flavour which would closely resemble that produced by the dry seasoning mixture.

The next step is to determine how much Nut Oil is required for solution of these mixed oils. It has been found that the least quantity of the concentrated seasoning which can be measured with accuracy is approximately 1 fluid oz. In the case of the dry seasoning—that is, 10 lbs. mace, 40 lbs. pepper, 50 lbs. coriander, totalling 100 lbs. mixed seasoning—let us assume that 4 oz. of this mixed seasoning is added to each batch of meat preparation; hence 100 lbs. of mixed seasoning would suffice to flavour 400 batches. This means that our concentrated oil flavour of 2 lbs. of Oil of Mace, 2 lbs. of Oleo Resin Pepper, and ½ lb. Oil of Coriander—that is, 4½ lbs.—will also flavour 400 batches. Since we wish to use 1 fluid oz. of Nut Oil containing the flavour per batch, we require altogether 400 fluid ozs.—that is, 2½ gallons of flavoured Nut Oil for 400 batches. This will be the equivalent of 100 lbs. of dry mixed seasoning. As a rough estimate, we may look upon the 4½ lbs. of mixed oils as occupying ½ gallon; hence we require 2 gallons of Ground Nut Oil to give our 2½ gallons of concentrated seasoning.

To prepare the mixture ready for use, proceed as follows: Take ½ gallon of Nut Oil, weigh in the Oil of Mace, Oil of Coriander, and Oleo Resin Pepper, and mix well and warm. Stir thoroughly while warm until the whole is homogeneous and all the mace melted. The temperature should not be above 120° to 130° F. owing to some of the essential oils being volatile. Having slightly warmed the remainder of the Nut Oil (1½ gallons), mix the two thoroughly and allow the whole to cool, stirring frequently until cold, when the mixture should be slightly viscous and homogeneous. The mixture is then ready for use.

It may happen that after long standing some of the resins and oils separate out. All that is necessary to bring the mixture back to its original condition is a thorough stirring. The mixture will remain in a satisfactory condition for days, sometimes weeks, and a good deal can be prepared for stock. It requires only thorough mixing before use, and should be stored in a cool place.

Another method tried was to mix these oils directly with the salt used, but this was found unsatisfactory, as the salt is not an efficient absorbent of the oil, and does not retain flavours as does the solution in Nut Oil.

At first sight it may be thought that the colour of the concentrated seasoning, which may be brown or green, may affect the colour of the meat preparations. This is not so; the quantity added is too small to have any effect.

Whilst in use the concentrated seasoning can be placed in a wide-mouthed earthenware jar, and the measured quantity can be removed with a standardised measure and the oils poured over the batch much in the same way as adding dry seasoning. It is hardly necessary to point out that only the best oils, Oleo Resins, and essences must be used; and while they may be expensive as compared weight for weight with the ground seasoning, this expense is only apparent, as it will be found that to produce the same flavour it is much more economical when using the oils than when using ground seasoning. It is very important to see that the various deliveries of the same type of oil are uniform and exactly alike in flavour.

One word of warning with regard to the comparison of oils. Two samples of the same oil, say Coriander Oil, may be derived from two different firms. On smelling the oils directly from the bottles they may appear similar, but this test is not sufficient. The real test of these oils is their "after-flavour." As a very rough, quick, and fairly accurate method of testing and examining flavouring oils the writer would suggest the following.

Dip a glass rod into each of the oils, and allow one drop of the oil to fall from the glass rod on to a piece of clean blotting-paper or filter-paper: use one drop and one piece of paper for each sample. After this is done, separate the papers about 1 foot apart and smell them in turn. Now leave them exposed to the atmosphere, and smell each of the papers at intervals of one hour for the first three hours, then leave over-night and smell again next morning. It is surprising what a difference will be observed in apparently similar oils, and it will not be difficult to decide upon the best flavour.

These tests can be repeated, only, instead of exposing the papers to the atmosphere, they are covered by glass tumblers or beakers, and covered again after smelling. This method will apply to oils such as Coriander, Cinnamon, Pepper Oil, Ginger Oil, Nutmeg, and so on. In the case of mace, the samples can be melted before taking a drop out on the rod. In the case of Oleo Resins as pepper and ginger, it would be advisable to dissolve a definite weight of the samples in a definite weight of Nut Oil and test as before. It must be understood that these are very rough methods of testing, but the writer feels sure they will easily discriminate between the good and the bad without involving lengthy analytical and physical examination.

In order that manufacturers should have some idea of what quantities of oils to use, it is required to know what percentages of oil the dry seasonings contain. The following are approximate figures only of the more common oils, resins, and essences.

(*Continued on page* 117.)

Some Notes on the Colouring and Flavouring of Ice-Cream

By E. L. E. HUMPHRISS, F.R.M.S.

Colour and flavour are major factors which exercise an important influence on "appetising value" and yet are probably given the least consideration of all the components which go to make up what has been called "the ideal food"—ice-cream. The author briefly discusses the main points of practical importance involved in the colouring and flavouring of this product.

THE PREVAILING flavour of plain—*i.e.*, vanilla—ice-cream should undoubtedly be the rich, creamy, entirely desirable, flavour of the wholesome dairy products of which it is constituted, and must have no suspicion of a "cooked" flavour. Ideally (in our opinion) the quantity of vanilla essence added should be just sufficient to impart a distinct, but not intruding, vanilla aroma and "bouquet," and on no account should mask or cloy the "dairy product" flavour. It is, of course, quite impossible to mention any specific quantities, as practically every brand of vanilla is of different strength and individual preferences differ, but the manufacturers' instructions can usually be taken at any rate as a basis for experiment. Here one would point out that every ice-cream manufacturer can, and should, conduct experiments as to the most advantageous quantities of essence to add, and, having determined what practice yields, under his own peculiar conditions, optimum results, he should rigidly adhere to these quantities until further experience or experiment makes a change in this practice unequivocally for the better.

Vanilla Extracts.

A word or two about vanilla extracts may not be out of place. Vanilla essences are prepared by a process of percolation and maceration (usually with a spiritous menstruum) from the fruit capsule of the *Vanilla planifolia*, indigenous to certain valleys of Mexico from whence the finest qualities are obtained. Bourbon beans (from the island of Reunion) are regarded as next to the Mexican in quality, whilst Tonka beans, Tahiti beans, and "Vanillons" are of inferior quality. The flavouring principle of vanilla beans is a well-defined chemical substance termed vanillin and, incidentally, practically no vanillin exists formed in the beans when gathered, but is produced in the balsam contained in the capsule during the process of "sweating" to which the beans are subjected subsequent to picking. Tonka beans are rich in a somewhat similar principle—coumarin—which possesses, however, a much harsher and less desirable flavour than vanillin, and is used in cheaper vanilla extracts to fortify the vanilla flavour. Vanillin is a phenolic aldehyde; coumarin is the anhydride of an unsaturated phenolic acid. Vanillin is to some extent itself used as a flavouring agent in ice-cream; one's experience with this indicated a concentration of about 1 oz. to 10 gallons of mix as being a suitable one for ordinary use. Recently a synthetic substance termed "Bourbonal," which is reputed to have four times the flavouring power of vanillin, has been introduced, but we have not yet had the opportunity of investigating it.

Colouring.

So much then for the flavouring of plain ice-cream; the question of colouring next arises. It is usually advisable to add a little yellow colouring matter to vanilla ice-cream to dispel the otherwise chalky whiteness of the product, which is especially marked in viscolised ice-cream. The most generally used and universally satisfactory agent for this purpose is annatto. This substance is a yellow colouring matter derived from the pulp enclosing the seeds of the *Bixa Orellana*, native to South America and West Indies, and is usually procurable in two forms, (1) as an oily solution for butter colouring and (2) as a weak alkali solution for cheese tinting. It is the latter colour which is used in ice-cream manufacture. Here, again, dogmatic statements as to quantities to use, etc., are impossible. It may be stated as a guide that 5 or 6 c.c. ($\frac{1}{4}$ fl. oz.) to each 100 lbs. of mix is sufficient to restore the natural butter-fat colour to the frozen product.

The most convenient stage in the manufacturing process at which to add both colour and flavour is, all things considered, immediately the mix is cooled down and in the holding vat, when the necessary additions can be made and thorough mixing and dispersion thereof ensured by agitation. Colouring and flavouring should never be added prior to pasteurisation, and if added to each batch as frozen should be so added right at the commencement of the freezing operation to avoid "streakiness," which results when colouring matter is added to a half-frozen charge in the freezer.

Rather more space has been devoted to vanilla ice-cream than remains for the consideration of the various other varieties of the product which ingenuity has evolved, though, when it is recalled that probably 90 per cent. of all ice-cream manufactured, at any rate in this country, is in the foregoing category, perhaps the space so allocated is justifiable.

Strawberry Ice-Cream.

Probably the next two most popular flavours in ice-creams are strawberry and chocolate, which together with vanilla often form bi- or tri-flavoured

bricks. The different stratas are arranged by one-half or one-third filling the mould, as the case may be, on consecutive days with the differently flavoured and coloured ice-cream, each layer being hardened over-night. In the case of strawberry ice-cream, the appropriate quantity of essence is added usually to the freezer hopper together with a percentage of crushed fruit and a sufficient quantity of strawberry colour. The first two items obviously allow a certain latitude in choice; the colour is usually a solution of dyes of the ethryosine and carmosine group and sufficient only should be added to produce a delicate strawberry tint and never enough to give a deep colour.

Chocolate Ice-Cream.

Chocolate ice-cream is frequently compounded from ordinary vanilla ice-cream and a chocolate syrup. A satisfactory, simple chocolate syrup can be prepared as follows:

Cocoa, 10 lbs.
Sugar, 15 lbs.

These are mixed dry and added to 2½ gallons of boiling water and stirred well until dispersed and dissolved, and then cooled. This syrup is readily decomposed by bacterial growth and, consequently, should be used as soon after preparation as possible and meanwhile stored in a cold room. One to 1½ gallons to 10 gallons of ice-cream mix will be found to yield a commendable chocolate ice-cream. Such a 10 per cent. addition obviously seriously affects the analysis of the resulting ice-cream, and in this and similar cases where significant quantities of flavouring agents have to be added—maple ice-cream, for instance—the more scientific way of going about it is to calculate a mix formula involving such ingredients to a definite analysis in the ordinary way.

A point here of considerable practical importance may be mentioned. Greenish-black discolorations in chocolate ice-cream not infrequently appear and are due to tannins in the cocoa interacting with iron salts derived from "rusty spots" in the ice-cream cans. These discolorations usually approximate in position to such spots and impart a fishy odour to the product. A test suggested by which cocoa prone to this trouble may be identified is the addition of a few drops of $FeCl_3$ to 10 c.c. of a 5 per cent. suspension of cocoa, when a black coloration indicates presence of tannins and alkali. So-called "Dutch Cocoa," in whose preparation alkali is used, is said to be more prone to this trouble than other types.

General Rules.

To deal in anything approaching detail with the multitudinous varieties of ice-cream made possible by the intelligent use of flavourings and colours is a task impossible in an article of this length, therefore, in conclusion, one or two observations of general applicability in this field will be mentioned. There is invariably an advantage in adding a quarter or one-third of the usual quantity of vanilla essence to specially flavoured ice-creams, irrespective of the identity of the principal flavour, as such an addition enhances or "brings out" the subtleties of this main flavour. In using colours an infinite variety of shades can be obtained by an artistic blending of the three primary colours—red, yellow, and blue—though colouring of ice-cream should never exceed a pastel shade in depth.

Aqueous solutions of colours may, if stored under favourable conditions, become grossly contaminated with bacteria. Examinations of such solutions made at the California State Department of Agriculture revealed as many as 93 millions of organisms per c.c. in certain colour solutions.

Such, then, are but a few of the numerous factors concerned with the flavouring and colouring of ice-cream, an aspect of the manufacture of the product too frequently given scant consideration, and illogically so, for the "psychic secretion" of our parotid glands contributes not a little to our gustatory enjoyment of food.

Inspection of Chickens before Packing, by Inspectors of U. S. Dept. of Agriculture. **(See page 100.)**

Packing and Sealing Chicken Products in Glass.
(Reproduced from "The Canner.")

Practical Hints to Colour Users

By "WORKS CHEMIST"

The following remarks by an old-established maker of colours are addressed to the manufacturer of foodstuffs. They convey much valuable advice of a strictly practical nature.

A PROFESSOR of Chemistry recently remarked that during a course of lectures he had several times been asked about colouring matters in foodstuffs, and most of his enquirers seemed to view them with distrust. Now, so much has been written in recent years about the harmlessness or otherwise of synthetic colours, that such distrust is understandable amongst the users of colours in foodstuffs who have very little, if any, knowledge of the products they are using. Such distrust, however, need not arise if the user takes the simple precaution of buying colours from a reputable manufacturer or merchant and insisting upon a guarantee of harmlessness which these firms will willingly give. One has only to appreciate the responsibility that the manufacturer is shouldering in giving such a guarantee, to realise that the goods in question must be quite harmless. Would any reputable firm risk its reputation by giving a false guarantee and chance the ruin of a business built up on years and years of hard work? It is merely necessary, then, to repeat: Place your orders for harmless colours in the hands of a reputable firm who will give you a definite guarantee, and let this guarantee be your security.

Difficulties.

The manufacturer of foodstuffs who contemplates producing a special line often finds, when he has perfected his product, that its colour fails to make an appeal. This is the time to call in the assistance of the colour manufacturer. Place your problem before him, give him your views as to the colour you would like, and let him help you to arrive at a solution of the difficulty. Much time and unnecessary waste of money would be saved if foodstuff manufacturers adopted such a policy, as many a maker of foods has found that after colouring his product and placing it on the market some change has taken place in the colour due to the action of his ingredients, and it is necessary to withdraw the product and start all over again. This, as can be easily understood, is often disastrous. Take the colour manufacturer into your confidence, therefore, and let him know the various actions his colour is required to resist and he will be able to supply you with a satisfactory article. This applies equally to the maker already producing. If you are not satisfied with your colour, put the matter before your supplier and let him provide something better.

Dissolving the Colour.

In some cases, users buy their colours already in solution, mixed with flavouring essences, etc., but where the colours are purchased in powder or crystal form the following hints on dissolving may not come amiss. The powder or crystals should be placed in a clean container and hot water (not necessarily boiling) added, at the same time keeping the liquor well stirred to ensure complete solution. The amount of colour to be used to the gallon depends entirely upon the depth of shade required, but it should be borne in mind that water has a definite saturation point, and if this is exceeded a deposit is bound to occur. Where a highly concentrated solution is made for use as such, it will be found an advantage to allow the solution to cool and to filter before use, as this will remove any undissolved particles of colour which may be in a state of fine suspension. These particles, if not removed, would be very liable to cause spots on the finished product. If solutions are made up and required to be kept on hand for any length of time, a small quantity of preservative should be added to prevent decomposition. This decomposition is not due to defects in the colour but to the water itself, and a little preservative will obviate this trouble. A definite strength of solution should be made on each occasion, as this will prevent variations in the final result and do away with much of the trouble experienced by slip-shod methods of use. The powder or crystals should be weighed and the water measured, guesswork being rigidly avoided, otherwise trouble is bound to occur and the user will have no one to blame but himself.

Application of Colours.

The application of colour to foodstuffs depends, of course, entirely upon the nature of the foodstuffs and cannot be dealt with collectively, but it can be here stated definitely that it is useless for anyone to add undissolved colours directly to foods which will have moisture added to them in the shop or home, unless they are prepared to risk spotting. Each minute particle of undissolved colour contains a highly concentrated staining power, and immediately the particle comes into contact with water its walls are destroyed and the staining power is liberated. This at once acts upon the adjacent material and unless the material is afterwards extremely well mixed spots will occur. The correct method is to dissolve the colour, damp the foodstuff down with the colour solution, then dry off thoroughly and grind. Often it is found that this process is too costly to permit of the drying and regrinding, and to overcome this it is suggested that if some of the material be coloured in this way to a much deeper shade than that ultimately required and, after being dried and re-ground, is mixed off with the remainder of the uncoloured material, the same result would be obtained. For instance, in the

colouring of cornflour if, say, 5 per cent. of the bulk to be coloured is damped down with the amount of colour solution necessary for the whole batch, dried off and ground and then mixed in with the bulk, the result would be an evenly coloured cornflour and should not be liable to speck.

Colouring Cordials.

In the colouring of actual solutions such as mineral waters, cordials, etc., provided the correct method of dissolving is adopted, very little trouble should arise, only small quantities being required to give the desired shades. Colours giving bright, clear solutions should be selected, unless the contrary is definitely desired, and care should be exercised to see that the colours supplied are suitable for the purpose in view. The colour manufacturer will be only too pleased to give you this information if you ask him.

Mixing Colours.

In connection with special shades, it has been suggested by some writers that users should buy certain standard colours and mix these together to produce their own shades. This is satisfactory in the case of some of the larger firms who have a technical staff watching closely all the processes and who have a thorough knowledge of colours, but in many cases the user's colour knowledge (even amongst chemists themselves) is so slight that colours which should never be mixed together under any circumstances are blended and much trouble is caused through precipitation of the one colour by the other. It is far better to let your supplier produce the exact mixture required, as his knowledge of the colours used will enable him to give the most perfect blends with even solubility of the components, which is very essential. Again, the facilities he has for making these mixtures enable him to turn out the same shades time after time, whereas mixtures made on the small scale by a consumer often vary and differences in the ultimate shade result.

Checking Deliveries.

Much more could be said on the subject if space and time permitted, but before concluding there is one point which cannot be too strongly stressed. Each delivery of colour received should be carefully tested against your standard before being put into use. Undoubtedly every effort is made by the supplier to ensure that the correct article is sent out, but their employees are human after all and liable to mistakes, and in view of the damage that can be done to a batch of foodstuff by a very small quantity of an incorrect colour, it behoves the user to ensure that his supply is correct before use. A standard bottle should be put up from the first delivery of the colour received, and all subsequent deliveries should be tested against this standard. As this standard is depleted, it can be replenished from an *approved* delivery, and thus a steady check kept upon this all-important raw material. The keeping of made-up solutions as standards is not recommended, as these are liable to fading, etc., after a time.

The Identification of the Prohibited Coal Tar Colours in Foodstuffs

VARIOUS schemes have been formulated for the detection of artificial colouring matter in foodstuffs, but the introduction of legislation prohibiting the use of certain colours has made it imperative that reliable methods should be available for the detection of the fine synthetic dyestuffs scheduled in the Public Health (Preservatives, etc., in Food) Regulations, 1925. These dyes are picric acid, victoria yellow, martius yellow, aurantia, and aurine.

In colouring either food or drink artificially, the dyestuff is used in minute quantities. According to the final report of the Dept. Com. on the use of preservatives and colouring matters in food, the amount of dyestuff used varies from 1 part in 2,000 parts of food to 1 part in 30,000 or even 50,000 in mineral waters. With such dilutions many of the usual distinctive reactions of dyestuffs are not effective.

All prohibited synthetic colours dye wool yellow from a weak acid bath, and the preliminary test suggested by Nicholls (*Analyst*, 1927, p. 585) can be used with advantage to show the presence of the prohibited colours. Many of the yellow dyes used in foodstuffs do not dye cellulose acetate, but it is interesting to note that all the prohibited dyestuffs dye this material yellow to orange shades. Specific tests are detailed, and results of experiments tabulated of a large number of tests; a standard procedure is also recommended. The article includes six excellently reproduced micro-photographs of the compounds by means of which the prohibited dyes are identified.

(*Abstracted from the "Analyst," 1928, vol. 53, pp. 418-423.*)

Forthcoming Exhibitions

April 1–4.—London Baking Trade Exhibition, New Horticultural Hall, S.W. 1.

April 1–12.—*Daily Dispatch* Health and Hygiene Exhibition, Manchester.

April 29–*May* 8.—Grocers' and Allied Trades' Exhibition, Manchester.

June 23–28.—Royal Sanitary Institute's Health Congress (41st) and Health Exhibition, Margate.

Sauerkraut

RECENT researches have shown that sauerkraut quality depends largely upon the temperature at which fermentation is carried out, the optimum being between 60-65° F. Higher temperatures gave off-flavoured, pink, and soft kraut. A rise of from three to five degrees occurs during the first eight days in vats held at temperatures above that of the surrounding air. This temperature rise is coincident with the greatest activity of the lactic acid bacteria.

Correspondence

To the Editor.

Dear Sir,

I have read Mr. Humphriss' article on "The Texture and Body of Ice-Cream," which was published in your last issue, with great interest, and would like to bring the following points to his notice, and shall be interested to hear his replies: We notice that he quotes N. E. Olsen as saying that he found no advantage accruing from the use of dried egg-yolk in ice-cream mix. In order to obtain the necessary fats and M.S.N.F. to make up the required constituents of ice-cream, it is, of course, often necessary to add certain solids, as the milk itself may not contain sufficient quantity of these essentials, especially if whole milk is not used. This can easily be obtained by the use of egg-yolk, owing to the fact that the yolk of an egg consists of 46·25 per cent. solids and 53·75 per cent. water. The solids in this yolk contained 17·5 per cent. oil or fat, and 28·75 per cent. mineral salts. Dried egg-yolk having a water content of approximately 5 per cent. brings thus the other constituents up to approximately 36 per cent. fat and 59 per cent. mineral salts. It therefore seems evident to us that a small quantity of egg-yolk would soon bring up any deficiency in fat to the required percentage, and the mineral salts when combined with the sugar would assist the thickening effect materially, and obviate the necessity of adding unnutritive substances to make up the body. Furthermore, the egg-yolk, even though dried, contains a high percentage of vitamins A and B, although the vitamin C has been lost in the drying. It therefore appears to us that egg-yolk is a desirable constituent for ice-cream mix.

To pass on to his paragraph about pasteurisation, we notice that he quotes J. C. Fleming as stating that improvement was effected by increasing the pasteurisation temperature up to 180° F. We would, however, point out that in our opinion any temperatures exceeding 150° are liable to harden the casein and destroy some of the essential vitamins. We therefore never advocate pasteurisation above this temperature.

Referring to his paragraph on homogenisation, he seems to favour the double stage homogenisation, but this, of course, brings up the old arguments which we thought were fairly well proved by numerous experiments in which workers had discovered that pressure was the governing factor in the breaking up of fat globules rather than the number of stages through which the fat globules passed. That is to say, in second-stage homogenisation raising it to a final pressure of 2,500 lbs. per square inch would give exactly the same atomising effect to the fat globules as if this had been done in the single stage of 2,500 lbs.

Mr. Humphriss' paragraph on ageing is certainly not borne out by our experience, as we have found that twenty-four hour ageing is undoubtedly advantageous, as the mix can be whipped up more quickly if it has been aged for twelve hours or more. We would draw a simile here with the whipping of pure cream. As you are well aware, fresh cream will not whip when sugar is added, but after ageing for a matter of twelve hours or more, it can be whipped both quickly and efficaciously. It is all the more essential to age for twenty-four hours with the modern freezing apparatus, such as the Direct Expansion Freezer, which gives such rapid freezing of each batch.

In the paragraph on freezing, although Mr. Humphriss does not say that overrun is unnecessary, it appears that he has rather detracted from its importance. We quite agree that it has no effect on the size of crystals formed, and that this is governed by the quickness of freezing. Nevertheless, overrun is so essential to the ice-cream maker that we think he might have enlarged upon the point further. Overrun up to 80 per cent. can be incorporated in ice-cream without detracting from its flavour or texture, and, if anything, greatly improving it.

Yours faithfully,

William Storer, Limited.

* * *

To the Editor.

Dear Sir,

Having studied Messrs. Wm. Storer's, Ltd., commentary on my article, I beg to submit my observations in reply.

This very interesting letter first mentions the question of egg-yolk and ice-cream in the following sentence. "In order to obtain the necessary fats and M.S.N.F. to make up the required constituents of ice-cream, it is, of course, often necessary to add certain solids, as the milk itself may not contain sufficient quantity of these essentials, especially if whole milk is not used. This can easily be obtained by the use of EGG-YOLK. . . ." It is surely hardly necessary to point out that it is quite impossible to augment *milk solids* with egg-yolk! Anyhow, reference to my article will disclose the fact that for one worker (Olsen), who reported against egg-yolk, two (Button and W. H. Martin) were mentioned as favouring its use. With regard to the enhancing of what one might term the fundamental dairy constituents of ice-cream the universally acknowledged view is that if your mix is to contain, say, 10 per cent. fat, in genuine ice-cream the only allowable fat is milk fat (or, as it is frequently termed, butter fat), and obviously the only source of such fat is milk or one of its products. This, incidentally, is the basis of all legislation on ice-cream, and was the basis of the proposed legislation in this country. It must be thoroughly understood that in dealing with genuine ice-cream, which one regards as containing not less than 8 per cent. of butter fat, 9 per cent. of M.S.N.F., and 13 per cent. of cane sugar, the addition of unnutritive substances to a mix of such a

minimum composition is entirely unnecessary, and it is to such a mix (as I quoted Button and Martin as saying) that a small percentage of egg-yolk could with advantage be added. For a mix testing 34 per cent. or over total solids, egg-yolk is not necessary or desirable, and does not improve the texture, and I state this quite definitely from my own experience.

Pasteurisation.—The reason at the back of my mind when I mentioned J. C. Fleming's observation was primarily a bacteriological one. It has been proved in this country that, for instance, the froth formed consequent upon agitation during pasteurisation may be as much as 18° F. lower in temperature than the bulk milk; and, further, that thirty minutes under these conditions (with the bulk at 145° F.) does not destroy the tubercle bacillus. With this fact in view the possibility of increasing the pasteurisation temperature, and therefore the bacteriological safety factor, without detriment, and, indeed, according to Fleming, with gain to the palatable quality of the product, is surely justifiably mentioned.

Homogenisation.—The critic was surely here not bearing in mind the scientific facts concerning homogenisation. The function of the second stage is *not* further to break up the fat *globules*, but to disperse the clusters of homogenised (and therefore smaller) fat globules which always form after single stage homogenisation. This is clearly stated in the article. Further, the most advantageous use of a double stage homogeniser is made when working with a pressure (about 500 lbs. only) just sufficient in the last stage to break up these clusters, and no more. One might also mention that, contrary to what is implied in the criticism, homogenisation pressure is not a fixed quantity, but should vary (within certain limits) inversely as the mix acidity.

Ageing.—The question of ageing is admittedly a bone of contention amongst ice-cream manufacturers, and the statements made in my article were grounded on the latest scientific work on the subject, as well as my own work and experience. Ageing results in an increase of apparent or colloidal viscosity, which is now universally acknowledged to be (1) not helpful to, if not definitely antagonistic to, whipping, and (2) anyway is rapidly destroyed in the freezer. Olsen states as late as November, 1929, that in a properly balanced and processed mix ageing is unnecessary, and C. S. Dable and J. I Keith in the *Ice-Cream Trade Journal* of the same month state that the body and texture of mixes aged four hours were equal to the body and texture of the twenty-four hours' aged mix. Mixes frozen within one hour of making were slightly poorer in texture. One ought in fairness to Olsen's work to add, he gives very definite instructions for processing the mix which includes standardising the acidity of the mix and homogenising at 150° F.

The cream analogy is obviously fallacious when one recalls the vast difference in the analytic composition of cream and ice-cream, and, incidentally, it is interesting to note that in the very early days of ice-cream manufacture, the cream used was actually aged for twelve to twenty-four hours until scientific investigation proved its superfluity.

Overrun.—It was certainly not my intention to detract from the importance of overrun, though the work mentioned of Professor Turnbow's certainly proves almost perfect smoothness can be obtained without any overrun whatsoever. Such an ice-cream would, of course, be soggy and quite unenjoyable, and reference to my article on "Packaging" in February FOOD MANUFACTURE will disclose that the importance of overrun is not minimised. Detailed discussion of *all* the factors concerned in an article of the prescribed length of "Body and Texture" is impossible, as was stated therein, and hence some aspect or other of the question is bound to receive "short commons."

I hope these few observations will convince my generous critics that at any rate what was written was only done after a certain amount of research and thought.

Yours faithfully,
E. HUMPHRISS.

To the Editor.

SIR,

We have read with great interest Mr. Humphriss' reply to our letter to you of February 24. One or two points occur to us, however, which we should like to bring to his notice.

With regard to the subject of egg-yolk, we consider that this revolves about the question of palatability rather than anything else. We would like to ask Mr. Humphriss whether he does not consider that a glass of milk with an egg whipped up in it is not more palatable than the same quantity of milk with a 50 per cent. cream added to it. The same argument applies in the choice of the constituents of ice-cream in obtaining the most palatable mixture, but at the same time having the same quantity of fats and solids.

Pasteurisation.—We evidently agree on the point that 145° F. is sufficient for the destruction of bacteria if the whole can be maintained at this temperature for half an hour. According to Mr. Humphriss, the weak point about this is that any froth accruing on the top of the mix is liable to be at a lower temperature and not properly pasteurised; but our experience is that in properly constructed equipment no froth occurs during the process of pasteurisation, and it is difficult to obtain a froth at these temperatures. Where this does occur, it is usually due to badly constructed pumps which whip the mix into a froth before it goes into the pasteuriser. We have certainly never experienced any trouble with frothing in our equipment.

Homogenisation.—Here, again, Mr. Humphriss agrees with us that the fat globules are broken up to the same size, whether the mix is subjected to single or double stage homogenisation, but claims that double stage homogenisation prevents these globules from congregating into colonies. Undoubtedly he has good authority for making this statement, but, nevertheless, we do not understand how this can be a fact, as, according to him, the globules still remain the same size and the mix is in no way altered by this second stage of homogenisation. It therefore appears to us that the surface

tension on each globule is the same, and would have the same attractive power to other globules whether it has been homogenised twice or not. We can therefore still see no object in second stage homogenisation.

In conclusion we would like to thank Mr. Humphriss for the careful way in which he has answered all our questions, and we hope that by raising these questions and having them replied to by such an authority as Mr. Humphriss, it will have been as interesting to your readers as to ourselves.

Yours faithfully,
WILLIAM STORER, LIMITED.

* * *

To the Editor.

DEAR SIR,

I should like to draw attention to a misapprehension which may arise in reading the article in the February issue, "Tinplate Containers for Foodstuffs," by Dr. Lewis.

At first sight it would appear that "Foodstuffs" is used in its broadest sense. This is not the case. The term is applied only to acid foodstuffs. The non-acid foodstuffs, principally meats, are not discussed—with one exception. The last sentence in the article states: "Meats packed in glass with lids of good quality tinplate without lacquer showed no signs of discoloration."

I cannot agree with this statement. My experience has shown that there are too many factors tending to produce discoloration on tinplate when in contact with meats. One of the factors is the tinplate itself. Although there may be a few exceptions, I venture to make the bold statement that there is no tinplate produced in this country which will stand up to the preservation of meats without showing some blackening or discoloration after commercial tests and handling. One may get an occasional lid showing no discoloration, but I would hesitate to authorise the general usage of tinplate in its natural state.

I claim that the preserved provision manufacturers and the lacquer manufacturers have done more to remedy this fault of staining and blackening than the tinplate manufacturers. The preserving trade attempts to get over the difficulties in its own way, and the lacquer manufacturers naturally suggest lacquers to cover the defects of the tinplate. I agree that there is no universally satisfactory lacquer, but I will say that I look at the moment to lacquer to save the tinplate.

As matters stand I cannot accept the plain statement that unlacquered, good quality tinplate will be perfectly satisfactory. I am quite open to have my views altered, but I must have definite and conclusive proof.

In case any tinplate manufacturers take exception to what I have said, I wish it to be understood that I am always willing to test out and examine any tinplate for meat perserving from any authoritative English firm. The firm of Poulton and Noel, Ltd., is only too anxious to assist, if it can, the English tinplate industry on a matter of importance which it does not seem to have bothered itself about. This letter is written with no other thought than that of assistance and co-operation.

A final statement: in the general discussion of tinplate staining and discoloration, I have never yet seen any mention made as to the purity of the tin used for covering. Surely minute quantities of impurities in the tin might easily assist in the formation of discoloration and blackening. I am eager to learn about it.

Yours truly,
A. SAMSON.

MESSRS. POULTON AND NOEL, LTD.,
LONDON, N. 7.

* * *

To the Editor.

DEAR SIR,

Mr. Samson's letter is interesting from the point of view of the manufacturer of lacquered plates. He refers to the last paragraph of my article, and if he will turn up the original reference which I quote he will find that the statement has the benediction of Mr. Osman Jones, a well-known authority on the subject. The American literature will also show that it represents the considered opinion of a large number of meat packers in U.S.A. As to the point of using low or inferior grade tin for tinplating purposes, I can assure him that there is no chance of this taking place for several reasons, viz.: (1) The tinplaters' difficulties are already sufficient without increasing them from this source; (2) a low grade tin could not be used from a technical standpoint; (3) tin is standardised on the London Metal Exchange; and (4) the present price of tin would not warrant it.

Yours truly,
E. W. LEWIS.

(*Continued from page* 110.)

Oleo Resin Pepper ...	...	5 per cent.
Oleo Resin Ginger ...	...	5 ,, ,,
Oil of Coriander ...	...	1 ,, ,,
Oil of Nutmeg ...	...	1-2 ,, ,,
Oil of Mace ...		10-20 ,, ,,
Oil of Cinnamon ...	...	1 ,, ,,
Essence of Sage ...	...	2 ,, ,,
Essence of Thyme ...	...	2 ,, ,,
Essence of Marjoram	...	2 ,, ,,
Oil of Cloves ...	...	15 ,, ,,

It is hoped that the foregoing remarks will convey to manufacturers the fact that the use of Concentrated Oils in place of dry seasonings is a commercial proposition. Furthermore, it will be found that the advantages obtained by the use of such materials are many, including the very important one of cost. In all fairness to the oils, it is certainly well worth while conducting trials and tests against dry seasonings in order to form an absolutely unbiassed opinion.

Trade News

MESSRS. YORK SHIPLEY, LTD., have recently supplied eleven machines to France and six to Spain. This brings the total number of York machines sold up to the beginning of March to 37,672.

* * *

Pamphlet No. 20, issued by Messrs. J. G. Jackson and Co., Glasgow, gives particulars of a number of this firm's standard filling machines, carton sealing machines, tin lidding machines and conveyors, and the "Jackson" Disc Grinder.

* * *

The 1930 issue of Sell's Directory of Telegraphic Addresses has just been published by Business Dictionaries, Ltd. It gives the names of 100,000 firms grouped according to name, telegraphic address, and trade. Amongst other features, it provides a list of Stock Exchange members, and of newspapers and periodicals.

* * *

The 1930 Paris Fair will be held from May 17 to June 1. Goods coming from foreign countries to the fair will be admitted provisionally without payment of Customs duties and, in addition, the French railway companies have a special rate for the transport of exhibits, with return free. Exhibitors and buyers having return travel tickets will be granted a free extension of fifteen days. The fair comprises about fifty sections. Particulars to be obtained from the Federation of British Industries, 39, St. James's Street, London, S.W. 1.

* * *

Messrs. J. and E. Hall, Ltd., have now opened a branch office and service depôt at 194, Pearse Street, Dublin. This is in charge of Mr. S. M. Poole.

* * *

An attractive set of twelve notable Continental views, size $7\frac{1}{2} \times 5\frac{1}{4}$ ins., have been received from Messrs. A. Boake, Roberts and Co., Ltd., essence distillers.

* * *

The Schedule of Competitions to be held at the Bakers' and Confectioners' Exhibition in September next is now being formulated, and the committee will meet shortly to consider suggestions, offers of prizes, etc. Should any member of the trade have any suggestions to offer, it is hoped that these will be sent to the Manager, Mr. H. S. Rogers, 11, Queen Victoria Street, London, E.C. 4, as soon as possible.

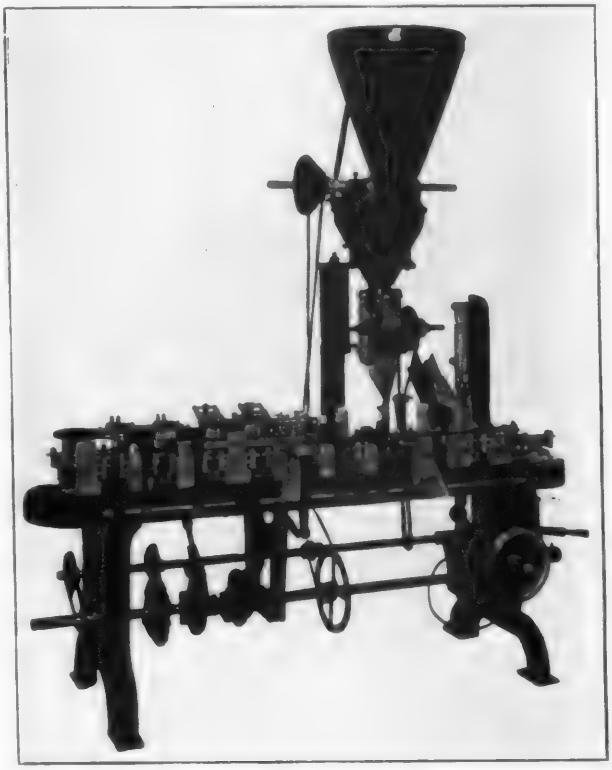
* * *

The certificate of the Institute of Hygiene has been awarded to Messrs. Goodwin Tidswell, Ltd., of Atlas Works, Carnarvon Street, Cheetham, Manchester, for purity, quality, and merit of their flavouring essences and colours. The firm are to be congratulated.

The Inaugural Banquet of the Coffee Board of Great Britain will take place in Grosvenor House, Park Lane, on Thursday, April 3. It will be a gathering representing all sections, from the Governments of coffee-producing countries to the retailers, who form perhaps the most important link in the distribution chain.

* * *

The following particulars of a new machine (illustrated below) have been supplied by Messrs. C. S. Du Mont. This machine is used for filling envelopes or small packages with powders from $\frac{1}{4}$ oz. to 6 ozs. The production is 30 to 35 filled and sealed envelopes, and the dimensions, 6 ft. × 30 ins. × 5 ft.

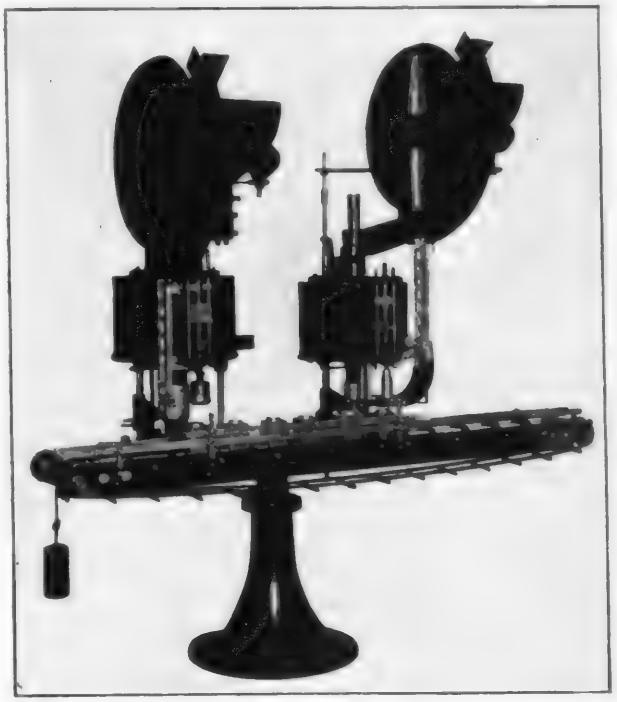


This machine is arranged with a magazine for holding approximately 800 envelopes; each envelope is picked out of the magazine and delivered to the envelope holder by means of an envelope picker. After the envelope holder receives the envelope it is delivered to the filler, and receives its proper amount. It is then passed on through a glue roller where glue is applied to the laps automatically. After this operation, the envelope is carried on through the lap folder where the seal is made. When this is done the envelope is automatically discharged. A 1 h.p. motor and one operator only are required.

* * *

Another new Du Mont machine (illustrated below) is for capping bottles, tins, or capsules with a small

disc. It operates in conjunction with the filler and sealer.



We note that Mr. Albert Henkel has been elected a Director of C. S. Du Mont, Ltd. Mr. Henkel is a prominent packaging engineer and noted linguist. This has been rendered necessary by rapid extension of business.

* * *

The Bay Stall Fishing Co., of Boston, U.S.A., are packing haddock fillets in separate wrappers. They are aiming at a production of 150,000 per day. The accompanying illustration is a photograph of sliced bacon put up by Swift in packages.

* * *

It is stated that an innovation in America is the direct printing on glassine, an example of which is

illustrated here. We are informed that these wrappers are now being used by Swift for wrapping cuts of meat, and it is suggested that the novelty is likely to threaten the trade of local butchers. The cuts are attractively trimmed ready for the kitchen.

* * *

We are informed that Messrs. R. Sharrock and Sons, bakers, will demonstrate the machine slicing and wrapping of loaves at the Health and Hygiene Exhibition to be held at the City Hall, Deansgate, Manchester, from April 1 to 12.

Books Received

We have received the following recent publications. *The Frozen and Chilled Meat Trade*, in two volumes, published 1929 by the Gresham Publishing Co., Ltd. This is a large work of 540 pages, with 20 plates and many illustrations. The following subjects are treated: The world's frozen and chilled meat trade; the Australian meat industry; New Zealand trade; South African meat supplies and industry; the Argentine trade; Uruguayan frozen and chilled meat trade; wholesale meat markets; refrigeration; design and equipment of meat-freezing works; meat inspection; the transport of frozen and chilled meat on land; transport of refrigerated meat by sea; the law relating to the chilled and imported meat trade; frozen meat insurances.

Another recent publication is the second edition of *Butter and Cheese*, by C. W. Walker Tisdale and Jean Jones, Sir Isaac Pitman and Sons, Ltd. This is a well-illustrated book of 146 pages, published at 3s. net.

From the High Commissioner of Canada we have received a bulletin entitled *Historical Account of the Lobster Canning Industry;* from the U.S. Department of Agriculture a circular on *Conservation of Wastes from the Small-Scale Slaughter of Meat Animals*, and a bulletin on *Marketing Fresh Fruit in Europe*. The California Agricultural Experiment Station has sent a copy of a thesis on *A Comparative Investigation of Certain Film-Forming Fungi*, by M. A. Joslyn and W. V. Cruess: this has been published in *Hilgardia*—a journal of agricultural science.

Imported Cardboard Boxes: Should they be marked?

A Merchandise Marks Enquiry

THE hearing of the enquiry under the Merchandise Marks Act, as to whether imported boxes and containers made of paper and cardboard should be required to bear a mark of origin, was resumed at the Office of the Board of Trade on Monday, February 24. (See page 92 of March issue of FOOD MANUFACTURE.)

The case for the opposition of the Electrical Importers' and Wholesale Traders' Association was summarised by Mr. N. L. Macaskie, who said that in an extraordinary number of cases the committee had recommended that goods the subject-matter of applications should be marked upon the container, with the obvious result that the public had been educated to realise that the mark was indicating the contents. It had been suggested that the mark should be "box made in Germany" or "carton made in Germany," but in many cases there was not room for that. In the terms of the Act there was no option given, and goods manufactured in foreign countries must bear the word "foreign," and goods manufactured in the Empire must bear the word "Empire." A serious legal difficulty might arise in the interpretation of the Act by the Board of Trade.

Mr. W. J. Morris, who appeared for the Food Manufacturers' Federation and the Manufacturing Confectioners' Alliance, chief opponents to the application, thought that Section 2 of the Act appeared to lay down two broad tests:

(1) Was it desirable that an order should be made?
(2) Would the Order be prejudicial to the trade of the United Kingdom?

The Act was designed in the interests of the consuming public, of which not one member supported the application. Was the public interested? Did the public really desire to know where the boxes came from? They did not want a prejudicial marking imposed. Supposing Toblerone chocolate was advertised for sale, and that the chocolate was made in England and the container abroad. The whole thing was being sold, the chocolate and the container, and the advertisement would have to read: "Buy Toblerone; which, as to the wrapper, comes into this country from abroad." The public were not concerned with boxes, except, perhaps, with Christmas boxes. The reality of the situation was that it could not be doubted for a moment that members of the public bought foodstuffs and articles they wanted, and the container was of no concern to them whatsoever. "The argument," Mr. Morris said, "that if you mark a container you confuse in the minds of the public the contents with the container, cannot be refuted."

If the chocolate manufacturers in this country could get the article, which they obtained abroad, in England at an economical price, there was no conceivable reason why they should not do so.

Mr. W. B. Faraday closed the case for the applicants, the British Paper Box Manufacturers' Federation. They had clear evidence of the desire to buy British goods, but it was impossible to tell the difference between British and foreign. Messrs. Lever Brothers and the Imperial Tobacco Company had not dissented from the application, and they were bigger consumers than Messrs. Cadburys.

The findings of the committee will be made known in due course.

Anniversary of Society of Public Analysts

ON March 4 the Society of Public Analysts and other Analytical Chemists held a Dinner at the Savoy Hotel to celebrate the Fifty-Fourth Anniversary of the foundation of the Society.

The President, Mr. Edward Hinks, M.B.E., B.Sc., F.I.C., said that since its inception the work of the Society had had a close relation to the Department of Government over which the Minister of Health now presided. That Minister and his colleague, the Minister of Agriculture and Fisheries, were responsible for the food laws, whilst the Public Analysts were the persons ultimately responsible for the carrying into effect of those laws. Chemists associated with other interests than those of the Public Analyst were also concerned with the food laws—he referred to the chemists of the food manufacturers and to many other chemists, even extending to those of the manufacturers of heavy chemicals. He welcomed the Regulations made by the Minister of Health, and said that in the public interest more were needed. It was the business of the Society to solve the difficulties that had been encountered. Among questions, other than food, which were of common interest to the Ministers and to the Society was that of water supplies and river pollution. He assured the Minister that the Society, in the technical matters which were within its province, was anxious to do everything it could to aid him and his brother Ministers in their work of government.

The Minister of Health, replying, said that food adulteration had become more subtle and required more extensive scientific skill to defeat it. He believed that in the end fraud and deception never had its way. He had the greatest belief in the power of knowledge, and he welcomed the contribution that the Society was making to scientific knowledge. Although Public Analysts were servants of the local authorities, the reports all came to him and he was in close touch with their work. With regard to food, the Public Analysts were the scientific police service. He was advised that improved social conditions depended principally upon housing, whilst others said that nutrition was the more important. He was glad to be the guest of the Society, for he had a very real appreciation of the work it was doing and wished it all success.

New Companies

Abraham Spielsinger, Limited. (245606.) 11, Mile End Road, Stepney, E. 1. To take over the bus. of a baker, pastry-cook, and confectioner cd. on at Stepney: Nom. Cap.: £5,000 in £1 shares.

Laidlaws, Limited. (245806.) 9, Deansgate, Bolton. To carry on the bus. of confectioners, bakers, provision mchts. Nom. Cap.: £6,000 in £1 shares.

J. Simson and Company, Limited. (245804.) To carry on the bus. of mnfrs. of and dlrs. in confectionery, etc. Nom. Cap.: £100 in £1 shares.

Downland Produce Company, Limited. (245765.) 3, Frederick Place, Queens Road, Brighton. To carry on the bus. of provision mchts. and caterers, etc. Nom. Cap.: £500 in £1 shares.

Supreme Confectionery Company (Leeds), Limited. (245955.) To take over the bus. recently commenced at 11, Sayner Lane, Hunslet, Leeds, as the "Supreme Confectionery Co." Nom. Cap.: £500 in 5s. shares.

Lincolnshire Canners, Limited. (245777.) To carry on the bus. of canners and dlrs. in all kinds of foodstuffs, etc. Nom. Cap.: £5,000 in £1 shares.

British Canners, Limited. (245764.) To carry on bus. as indicated by the title. Nom. Cap.: £5,000 in £1 shares.

Tunbridge Wells Biscuits, Limited. (245853.) Boughton House, 10 and 12, Church Road, Tunbridge Wells. To carry on bus. as indicated by the title. Nom. Cap.: £2,000 in £1 shares.

Crossmaur, Limited. (245731.) Craven Bank Chambers, Keighley, Yorks. To carry on the bus. of mnfrs., importers and exporters of and dlrs. in prepared puddings, chocolate, confectionery, etc. Nom. Cap.: £300 in £1 shares.

Newall Brothers, Limited. (245884.) 30, Williamson Street, Liverpool. To carry on the bus. of wholesale and/or retail provision mchts., etc. Nom. Cap.: £15,000 in £1 shares.

Mol-Dor Confectionery Company, Limited. (245913.) 22½, Cazenove Road, Stoke Newington, N. 16. To take over the bus. of a confectionery mnfr. cd. on at Stoke Newington by T. O. Henderson. Nom. Cap.: £4,000 in £1 shares (2,000 pref. and 2,000 ord.).

Mayam, Limited. (245712.) 23, Tanner Street, Bermondsey, S.E. 1. To enter into an agmt. with R. Smith and Co. (Holland), Ltd., for the acquisition of the bus. cd. on under that name, together with the trade mark "Mayam," and to carry on the bus. of mnfrs. of and dlrs. in the proprietary brand of sweetmeats known by that name. Nom. Cap.: £5,250 in 5,000 ord. shares of £1 and 5,000 vendors' shares of 1s. each.

Frank Walker (Confectioners), Limited. (245988.) To take over the bus. of a baker and confectioner cd. on at 209, Normanton Road, 141, London Road, 36, Market Place, and elsewhere in Derby, by the late Frank Walker. Nom. Cap.: £2,500 in £1 shares.

Cape Fisheries, Limited. (245968.) To enter into an agmt. with Islay Trawlers, Ltd., and to carry on the bus. of owners of steam and other fishing vessels, etc., at the Port of London and elsewhere. Nom. Cap.: £25,000 in £1 shares.

Candies, Limited. (246061.) To carry on the bus. of confectioners, grocers, and provision mchts., etc. Nom. Cap.: £300 in £1 shares.

Deinhard and Company, Limited. (246090.) To carry on the bus. of growers and shippers of wines and spirits, mnfrs. of and dlrs. in vinegar, acetic acid, glucose, preserves, etc. Nom. Cap.: £50,000 in £1 shares.

A. B. Hemmings, Limited. (246033.) 200, Fulham Road, S.W. 10. To take over the businesses of A. B. Hemmings, and to carry on the bus. of bakers, caterers, etc. Nom. Cap.: £60,000 in £1 shares.

Nutravite, Limited. (246122.) To enter into an agmt. for the acquisition of the trade mark "Nutravite," and to carry on the bus. of mnfrs. of and dlrs. in foods, food products, patent medicines, etc. Nom. Cap.: £10,000 in 14,000 ord. shares of 10s. each and 60,000 deferred shares of 1s. each.

Rogers, White and Company, Limited. (246377.) To take over the bus. of fruit brokers and mchts. cd. on at the Fruit Exchange, Victoria Street, Liverpool, by J. H. Rogers and J. W. White, in co-partnership. Nom. Cap.: £50,000 in £1 shares (20,000 pref. 20,000 ord. and 10,000 "A" ord.).

Howe Steam Fishing Company, Limited. (246367.) To carry on bus. as indicated by the title. Nom. Cap.: £8,000 in £1 shares.

Mayhew, Baker and Company, Limited. (246339.) To carry on the bus. of factors of, agents for, and dlrs. in salt, tea, coffee, cocoa, sugar, and other natural products, etc. Nom. Cap.: £1,000 in £1 shares.

Darrington's Proprietary, Limited. (246328.) 236 and 258, Central Meat Markets, E.C. 1. To acquire shares, stocks, debentures, and securities, etc. Nom. Cap.: £10,000 in 10,000 "A" shares of 1s. each and 9,500 "B" shares of £1 each.

Associated Canners, Limited. (246396.) 10, Philpot Lane, E.C. To acquire all or part of the issued share capital in Angus Watson and Co., Ltd., Richard B. Green and Co., Ltd., and Pelling, Stanley and Co., Ltd., and to carry on the bus. of catchers, curers, packers, and canners of and dlrs. in fish and the by-products thereof, canners of and dlrs in meats, fruits, milk, etc. Nom. Cap.: £1,650,000 in £1 shares.

Poultry Plucking Machines, Limited. (246269.) Finsbury House, Blomfield Street, E.C. 2. To enter into an agmt. with J. B. Kingdon, G. Bingham, the Hardy Trust, Ltd., and H. C. Rogers, and to acquire (*inter alia*) the patents therein specified, granted to the two first-named parties for inventions relating to mechanical poultry plucking and stubbing machines, etc. Nom. Cap.: £20,000 in 15,000 preference shares of £1 each and 100,000 ordinary shares of 1s. each.

(*Continued from page* 124.)

PEARLS OF YOUTH

505,916. **Ingredients in powder form for use in making foodstuffs.** PEARLS OF YOUTH, LTD., Imperial House, Cavendish Square, London, W. 1. February 12.

DOREX

507,859. **Pork and beef sausages, luncheon sausage, and brawn.** HERBERT GRIFFITH KINGHAM, trading as Herbert G. Kingham and Co., The Stores, Station Road, Dorking, Surrey. February 5. (By consent.)

LYRIC

508,631. **Condensed milk.** HARRY PHILLIPS, 306, Battersea Park Road, London, S.W. 11. Feb. 5.

MARUSAN

508,428. **Canned salmon and canned crab.** SEISHICHI ITCH, trading as S. Itch and Co., 6, Tokiwa-cho, Kyobashi-Ku, Tokio, Japan. February 5.

GOLDEN BIRD

509,972. **Hams and bacon.** HUGHES BROS. (MANUFACTURERS), LIMITED, 22, New Bird Street, Liverpool. March 5.

PIEKIN

509,004. **Substances used as food or as ingredients in food, but not including sugar, and not including any goods of a like kind to sugar.** J. SAINSBURY, LIMITED, Stamford House, Stamford Street, Blackfriars, London, S.E. 1. March 5.

HUBRO

510,328. **Hams and bacon.** HUGHES BROS. (MANUFACTURERS), LIMITED, 22, New Bird Street, Liverpool. March 12.

EXCELSIOR

509,168. **Canned vegetables and dried vegetables.** SAML. HANSON AND SON, 14, Eastcheap, London, E.C. 3. March 12.

BELMERE

509,451. **Cheese.** KRAFT CHEESE COMPANY, LIMITED, Silverdale Road, Hayes, Middlesex. March 12.

ELEDON

508,670. **Fresh and condensed milk, powdered milk (for food), milk foods, infants' food, butter milk (for food), and food preparations made from milk or butter milk.** NESTLÉ AND ANGLO-SWISS CONDENSED MILK CO. (a Company incorporated under the laws of Switzerland), Cham and Vevey, Switzerland; and St. George's House, 6 and 8, Eastcheap, London, E.C. 3. March 12.

Extracts from Papers

Transparent Emulsions of some Essential Oils. R. E. Lineham and W. F. Whitmore.

This paper gives a résumé of the methods employed to prepare transparent oil in water emulsions, using various water-soluble gums and gelatin as the peptising agents and strong aqueous sugar solutions as the dispersion medium. The stability of these emulsions has been investigated, and the liminal quantities of peptising agent required for a given concentration of oil have been determined. Transparency is secured by adjusting the refractive index of the dispersion medium to that of the oil. The troublesome phenomenon of "graining," which occurs when concentrated solutions of invert sugar are allowed to stand, has been overcome, and a method of preparing stable transparent emulsions of essential oils in sugar solutions is presented.

The Pectin from Orange Albedo. J. R. Bowman, R. B. McKinnis, and C. G. King.

A compound similar to digalacturonic acid was isolated from orange albedo. The ratio of the carbon dioxide and furfural yields of the compound and the albedo shows that the albedo contains no free pentoses and that the acid is a pentose-uronic acid. The pentose was isolated and identified as l-arabinose-diphenylhydrazone. The uronic acid was isolated as the barium salt and identified by the mucic acid yield and its optical rotation as galacturonic acid. The chief structural unit of orange albedo pectin was thus shown to be probably arabino-galacturonic acid.

(*Continued from page* 104.)

effect will then be obtained. Too much flavour will mar a line just as effectively as too little.

Lettered rock—that delectable lump of sweet stickiness without which no child's holiday is complete—is in a class by itself. Here, again, tradition has established the pink colour and peppermint flavour, and although it can be obtained nowadays in a variety of other flavourings—greengage, pineapple, and lemon being the next favourites, with appropriate colouring—mint rock with its familiar pink casing is still the most popular, and, judging from some of the colours seen, justly so; which goes to prove that the original maker of this product was a man of some discernment.

Old Flour an "Improver"

IN the sixth annual report of the Research Association of British Flour Millers, it is stated that very old flour acts as an "improver" when mixed with normal flour in the proportion of 5 or 6 lbs. per sack. In some cases the effect is quite as marked as the best that can be obtained by the use of chemical improvers. This remarkable result was discovered during a comprehensive investigation of the effects of ageing and storage on flour quality. Extensive baking tests were carried out, and many hundreds of analytical determinations made.

Current Literature

Fruit and Vegetable Products

123. Pectin Content of Grapes. G. Marsh and G. A. Pitman. (*Fruit Prod. J.*, February, 1930, p. 187.)

124. Chemical Composition and Food Value of Oregon Dried Prunes. J. S. Jones and D. E. Bullis. (*Ore. Agr. Expt. Sta. Bull.* 249, 1929.)

125. Relation of Temperature to the Quality of Sauerkraut. E. A. Martin and others. (*J. Agr. Res.*, 39, 1929, p. 285.)

126. Sulphur Spray Residues and the Swelling of Tin Cans Packed with Peaches. C. W. Culpepper and H. H. Moon. (*Ibid.*, p. 31.)

127. The Use of Sulphur Dioxide in Shipping Grapes. H. E. Jacob. (*Calif. Agr. Expt. Sta. Bull.* 47, 1929.)

128. Advanced Methods of Fig Packing. M. Madsen. (*Canner*, No. 9, 1930, p. 25.)

Cereal Products

129. Staling of Bread. W. Platt. (*Cereal Chemistry*, January, 1930, p. 1.)

130. Relation between Protein Content and Quality of Wheat as shown by Different Baking Methods. R. K. Larmour. (*Ibid.*, p. 35.)

131. Buffer Intensities of Water Extracts and Suspensions of Various Flours at Different H-ion Concentrations. G. E. Holm and E. Grewe. (*Ibid.*, p. 49.)

132. Effect of Variation in Ingredients on Colour of Chocolate Cake. E. Grewe. (*Ibid.*, p. 59.)

133. Evaluating the Quality of Wheat Varieties by Co-operative Tests. C. O. Swanson. (*Ibid.*, p. 66.)

134. Value of the Viscosimeter in a Commercial Flour Mill Laboratory. A. B. Sasse and J. T. Pearson. (*Ibid.*, p. 79.)

135. New Aids in the Ashing of Flour. F. M. Walters. (*Ibid.*, p. 83.)

Dairy Products

136. Irradiation of Milk for Increasing its Antirachitic Potency. D. Nabarro and J. O. Hickman. (*Lancet*, January 18, 1930, p. 127.)

137. Anaerobic Bacteria Causing Black-Rot of Eggs. R. M. Bohart. (*Am. J. Hyg.*, 1930, p. 168.)

138. Rusty Spots in Cheddar and other Cheese—I. J. G. Davis and A. T. Mattick. (*J. Dairy Res.*, November, 1929, p. 50.)

139. The Organisation of Dairy Research in New Zealand. E. Marsden. (*Ibid.*, p. 64.)

140. Use of Citric Acid and Sodium Citrate in Starter Cultures. (*J. Dairy Sci.*, January, 1929, p. 21.)

141. The Utilisation of Whey. M. A. Barnett. (*New Zealand J. Agric.*, January, 1929, p. 36.)

Analysis

142. Chemical Treatment of Lemon Residues. Determination of Pectins. B. Melis. (*Giorn. Chim. Ind. Appl.*, 1929, p. 399.)

143. Honey and Gingerbread. C. I. Kruisheer. (*Z. Unters. Lebensm.*, 1929, p. 282.)

144. Mineral Content of the Jujube or Chinese Date. M. P. Benoy. (*J. Agric. Res.*, 1929, p. 949.)

145. Separation of Maize Starch added as Adulterant to Egg Powder. Comte. (*Ann. Falsif.*, 1929, p. 600.)

146. Detection of Fruit Wine in Grape Wine. A. Röhling and J. Richarz. (*Chem. Ztg.*, 1930, p. 61.)

147. Chicory Agglomerates and their Adulteration. L. Gobert. (*Ann. Falsif.*, 1929, p. 580.)

148. Studies with Methylene Blue. I. J. Fuchs. (*Woch. Brau.*, 1929, p. 437.)

149. Illipene and the Higher Alcohols in Commercial Illipé Butter. M. Tsujimoto. (*J. Soc. Chem. Ind. Japan*, 365 B, 1929.)

150. Determination of Labile Sulphur in Gelatin and Proteins. S. E. Sheppard and J. H. Hudson. (*J. Ind. Eng. Chem., Anal. Ed.*, 1930, p. 73.)

151. Determination of the Liquefying Power of Malt Diastase. S. Józsa and H. C. Gore. (*Ibid.*, p. 26.)

152. Colorimetric Determination of Arsenic. A. Polijakow and N. Kolokolow. (*Biochem. Ztg.*, 1929, p. 375.)

153. Quantitative Determination of Composition of Potato Starch. G. Bredemann and O. Nerling. (*Chem. Ztg.*, 1930, p. 87.)

154. Quantitative Determination of Shell in Cocoa and Cocoa Preparations. M. Wagenaar. (*Pharm. Weekblad*, 1929, p. 1185.)

155. Determination of Caramel formed during the Roasting of Ground Coffee. A. Rifé and L. Medrano. (*Anal. Fís. Quím.*, 1929, p. 313.)

156. Heat-Resistance Curve; Bacteriological Test for Pasteurised Food. C. Dukes. (*Analyst*, January, 1930, p. 14.)

157. Detection and Determination of Nitrates and Nitrites in Meat Foods. H. C. Snethlage. (*Chem. Weekblad*, 1929, p. 612.)

Various

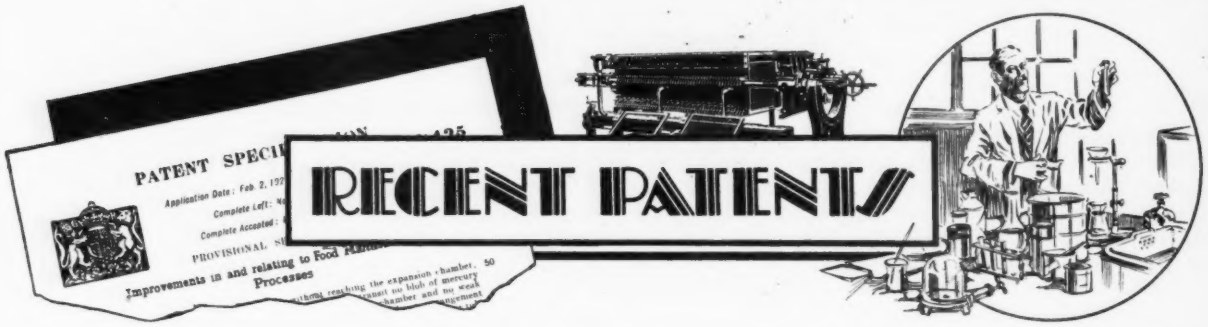
158. Influence of Copper-Bearing Steels on Can Corrosion. J. E. McConkie. (*Canner*, February 8, 1930, p. 13.)

159. Dextrose as a Marshmallow Ingredient. J. M. Krno and A. Schildtberger. (*Mfg. Conf.*, February, 1930, p. 51.)

160. The Pressing of Cocoa Butter. E. Benyon. (*Ibid.*, p. 45.)

161. Ratfish-Liver Oil as a Source of Vitamin A. E. R. Norris and I. S. Danielson. (*Ind. Eng. Chem.*, 1929, p. 1078.)

162. The Structure of Fats and its Bearing on their Utilisation. T. Hilditch. (*J. Soc. Chem. Ind.*, March 14, 1930, p. 210.)



These particulars of New Patents of interest to readers have been selected from the Official Journal of Patents, and are published by permission of the Controller of H.M. Stationery Office.

Latest Patent Applications

4734. GRAHAM, E.: Dough-dividing machines. March 7.

6694. BOEHRINGER SOHN AKT.-GES., C. H.: Preserving egg products, etc. Feb. 28.

6474. BROWN, C. AND MCCONNELL, S. AND WILSON, J. E.: Delivery of bread, etc., from baking apparatus. Feb. 27.

5454. ACTON, W.: Preventing crystallisation in boiler-sugar confectionery. Feb. 19.

5879. CLARK, G. M. (STELLA AND TESSIER): Preservation of foodstuffs. Feb. 21.

5302. LINDNER, P.: Flavouring foods. Feb. 17.

Specifications Published

325,539. BATES, J. H.: Machines for making wafer biscuits and the like.

325,685. FAIRWEATHER, H. G. C. (MARITIME FISH CORPORATION, LTD.).: Freezing fish, meat, and other foodstuffs.

325,777. RUSSELL, R.: Dough and like mixing machines.

319,700. PETERS, J. P.: Mechanical shaping of dough.

325,389. REICHE, K. A. M.: Apparatus for the production of chocolate bodies or the like.

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, at the uniform price of 1s. each.

Abstracts Published

323,546. **Butter.** SIEDEL, J., 10, Georgenstrasse, Cammin, Pomerania, Germany.

For making butter, cream of high fat content is cooled to a temperature between, say, 2° to 10° C., and is spread or swept in a uniformly thin layer over a surface, without aeration of the cream during butter formation.

323,740. **Drying fruit, etc.** SYKES, G. A., 49, Bonn Place, Weehawken, New Jersey, U.S.A.

Air and gases, controlling humidity and direction of flow of; small chambers.—In a process for drying fruit, vegetables, fish, meat, etc., the material is subjected alternatively to heat in a still atmosphere and in a current of hot gases.

323,815. **Refrigerating.** MITFORD, E. R. AND CRUMP, L., 1, Greycoat House, Greycoat Place, London.

Refrigerating, absorption machines and systems for.—Refrigerating apparatus of the kind in which cold is produced by the evolution of refrigerant vapour from solution comprises a generator-absorber, absorber and an evaporator provided with an ice cell.

323,810. **Cooking apparatus.** RUSSELL, F. C. (trading as RUSSELL, NEWBURY AND CO) and another, Grosvenor Road, Altrincham, Cheshire.

Cooking apparatus, heating on internal combustion engines.—Portable cooking apparatus is heated by the exhaust gases of an internal-combustion engine, the exhaust pipe of which is fitted with an adapter having an opening on its side to receive the portion of the cooking apparatus.

Recent Trade Marks

This list of Trade Marks of interest to readers has been selected from the "Official Trade Marks Journal," and is published by permission of the Controller of H.M. Stationery Office.

SOLUGA

509,491. **All goods included in Class 42 which includes substances used as food or as ingredients in food.** ALFRED C. TURNER, LIMITED, 20, Budge Row, Cannon Street, London, E.C. 4. February 19.

HAPPY LIFE

508,687. **Margarine.** A. J. MILLS AND COMPANY, LIMITED, Colonial House, Tooley Street, London, S.E. 1. February 19.

ALCA

508,248. **Tinned meats.** DANO, LIMITED, Bank Chambers, 329, High Holborn, London, W.C. 1. February 19.

(*Continued on page* 122.)